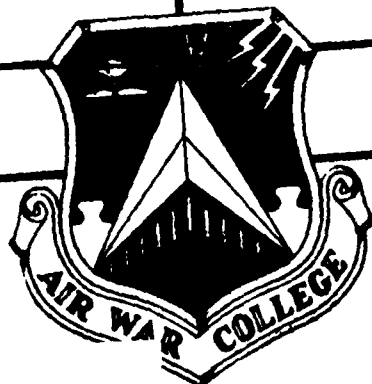


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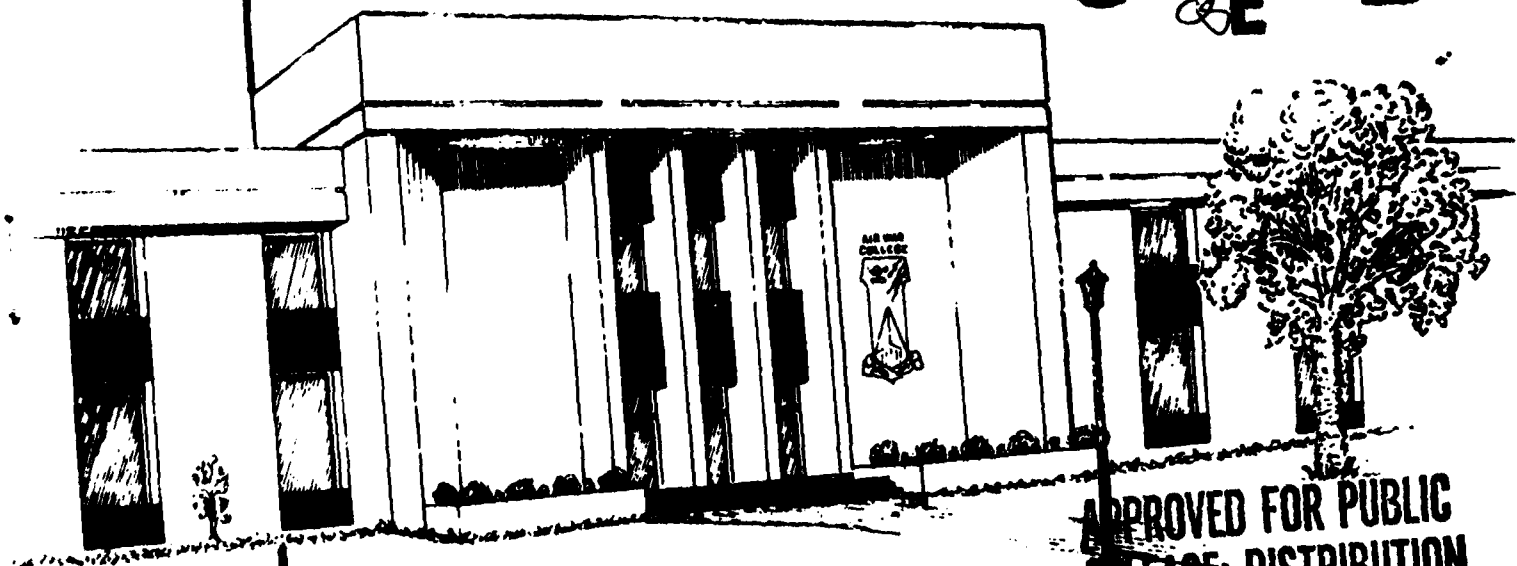
DEFENSE AIRLIFT--GETTING THE  
MOST FROM OUR AIRLINE FLEETS

LT COL THOMAS J. STEPHENSON

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UNITED STATES AIR FORCE  
MAXWELL AIR FORCE BASE, ALABAMA

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DEFENSE AIRLIFT--GETTING THE MOST FROM OUR AIRLINE FLEETS

by

Thomas J. Stephenson  
Lieutenant Colonel, USAF

A DEFENSE ANALYTICAL STUDY SUBMITTED TO THE FACULTY  
IN  
FULFILLMENT OF THE CURRICULUM  
REQUIREMENT

Advisor: Colonel Charles J. Jernigan III

MAXWELL AIR FORCE BASE, ALABAMA

May 1989

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## EXECUTIVE SUMMARY

**TITLE:** Defense Airlift--Getting the Most from our Airline Fleets

**AUTHOR:** Thomas J. Stephenson, Lieutenant Colonel, USAF

This paper analyzes five proposed programs to increase the effectiveness of the commercial airlines of the United States:

1) Establish a new national landing fee policy in the United States. Fees are to be varied based on the usefulness of the landing aircraft to national defense.

2) Open up selected military airfields for joint use by those airlines which contribute most to the Civil Reserve Air Fleet (CRAF).

3) Recompute the method of determining how \$662.8 million in airlift contracts are awarded, to recognize those companies which operate the aircraft best suited for use in a national emergency.

4) Recompute reimbursements for CRAF modification to better acknowledge the penalties of carrying the extra weight.

5) Ensure the current CRAF Enhancement Program remains viable even in the current boom period for the airline industry.

The paper shows that the U.S. government is the major factor in the health of the nation's airlines. The government has an obligation to also insure the airline fleet will meet defense needs.

Careful management of the commercial fleet adds very significantly to military capability. To maintain a healthy fleet, and one that meets defense needs, the author urges action on the five documented programs.

## BIOGRAPHICAL SKETCH

This is the second paper by Lt Col Jeff Stephenson on the role of the airline fleet in national defense. The first, "Leverage Leasing--a Way to Increase Defense Airlift," was the Air Force Business Research Award winner for 1983.

Lt Col Stephenson graduated from the Air Force Academy in 1969. After pilot training, he was assigned to fly C-141s at Charleston AFB. In 1974, he was assigned manager of studies on the Soviet Union and China at Squadron Officers School, and in 1977 served on the staff of Air Command and Staff College.

In 1978, Lt Col Stephenson moved to Military Airlift Command Headquarters where, as executive agent for the Military Airlift Committee of the National Defense Transportation Association, he worked with leaders of the transportation industry, several of whom have contributed to this paper.

After Air Command and Staff College in 1982, Lt Col Stephenson was assigned to Headquarters U.S. European Command, in Stuttgart, Germany, where he served until 1985. He came to Air War College from a tour as commander of the 1401st Military Airlift Squadron (MAC) flying C-21 Learjets from five locations in central United States.

He is a command pilot with over 3700 flying hours in C-141, T-29, C-131, CT-39, and C-21 aircraft. He has two

masters degrees, in Political Science and in Business Administration, both from Auburn University at Montgomery. He is married to the former Julie Farthing and has two children, Sarah (14), and Suzanne (10).

Lieutenant Colonel Stephenson is a student in the Air War College class of 1989. After graduation, he is assigned to Headquarters, Air Force Reserves at the Pentagon, Washington DC.

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## CHAPTER I

### A NEW LOOK AT THE CIVIL-MILITARY AIRLIFT PARTNERSHIP

The purpose of this study is to ensure that future U.S. airline fleets meet the needs of defense airlift. We cannot accomplish wartime tasks without the help of our airlines and it is imperative for us to maximize the usefulness of the nation's commercial airlift fleet.

Civil-military airlift is a timely subject. In June 1987, the President of the United States published a long-needed "National Airlift Policy" directing military leaders to work together with the civilian airlines to create an effective airlift system (Appendix 1). Consequently, the Senate Appropriations Committee Report on the Fiscal Year 1989 Department of Defense Appropriation Bill required the Department of Defense to recommend specific legislation to accomplish the President's goals. On 18 February 1989, the Secretary of the Air Force submitted the proposed legislation (Appendix 2) which closely parallels the logic of this paper and moves in the directions recommended in this study. Reports from the Pentagon indicate the proposal was well received in Congress, and is generating committee action as this paper is published.

In my view, proposed legislation may not be sufficient to meet the President's challenge. Rather it

should be seen as one of many required steps along an historical continuum. The military and the U.S. airlines have taken many steps along the continuum together in the past, and the Secretary's recommendation is another needed step. My job in this paper is to recommend the next steps in the same direction.

In the next chapter I will outline the historical civil-government airlift partnership. The purpose is to demonstrate that the United States has from the beginning maintained a symbiotic relationship with its national airlines. When the airlines needed government help to get going, the government acted, as in the days when mail contracts represented the major source of income for the fledgling airlines. In return, when the nation needed emergency airlift, the airlines were there. In World War II, Pan American Airlines trained our initial cadre of transport pilots and half of the aircraft in the U.S. airline fleet were turned over to the military. During the war, the airlines and the military transport system were actually melded into one organization. (1:50) In the Berlin airlift, and during the Korean War, commercial planes and crews were indispensable.

The historical perspective of chapter two, then, sets the stage for the "logic of airlift" in the next chapter. The steps I outline in chapter three lead the reader to an understanding not only of the efficacy of having a capable civil air fleet, but also of the critical

importance that fleet plays in any future war. When we go to war, we go as a civil-military airlift team. Ninety-five percent of wartime passengers will be carried by civilian airlines, and twenty-four percent of wartime cargo goes in a civilian airliner. (see Appendix 2)

My next chore was to investigate the state of the current military-airline partnership. For the past ten years, the government has been spending money to try to tailor the civil fleet to be able to better carry defense cargo in an emergency. The Civil Reserve Air Fleet (CRAF) Enhancement Program is the title of this program which has shown some progress, and great potential. Chapter four shows the progress made in CRAF Enhancement and suggests ways to take advantage of the building momentum in this direction.

After reading the early chapters, the reader should be asking, "How do we maximize this essential airlift partnership?" This is the central question of the paper, and the rest of the work is dedicated to showing ways to get the most from our national airlines. The ideas are not all new, but my hope is that they will be more easily understood when put together in the historical context. Most importantly, I have attempted to provide an analysis of these ideas and suggest a plan to implement the ideas.

My goal is by the end of the paper to have:

1. Provided an historical context for civilian-governmental cooperation in airlift,
2. Convinced the reader that an active program is necessary to ensure that the partnership is ready for wartime tasks,
3. Identified five new ideas for enhanced cooperation between government and airline,
4. Analyzed the options by organizing them according to their strong and weak points, and
5. Provided a method for evaluating these and other options for enhancing civil airline fleets to meet emergency wartime airlift.

I found that there is no one best approach to the problem. However, as I researched the options for increasing defense airlift capability through partnership with commercial airlines, I became excited about some of the possibilities. I was encouraged first because the Air Force is moving forward in the direction I am recommending; but more importantly, some of the ideas themselves show outstanding potential. They can be done and I am convinced they should be done. Some are inexpensive, and some even pay for themselves. Some make our airlines more competitive worldwide. Most take advantage of trends already evident in the airline business.

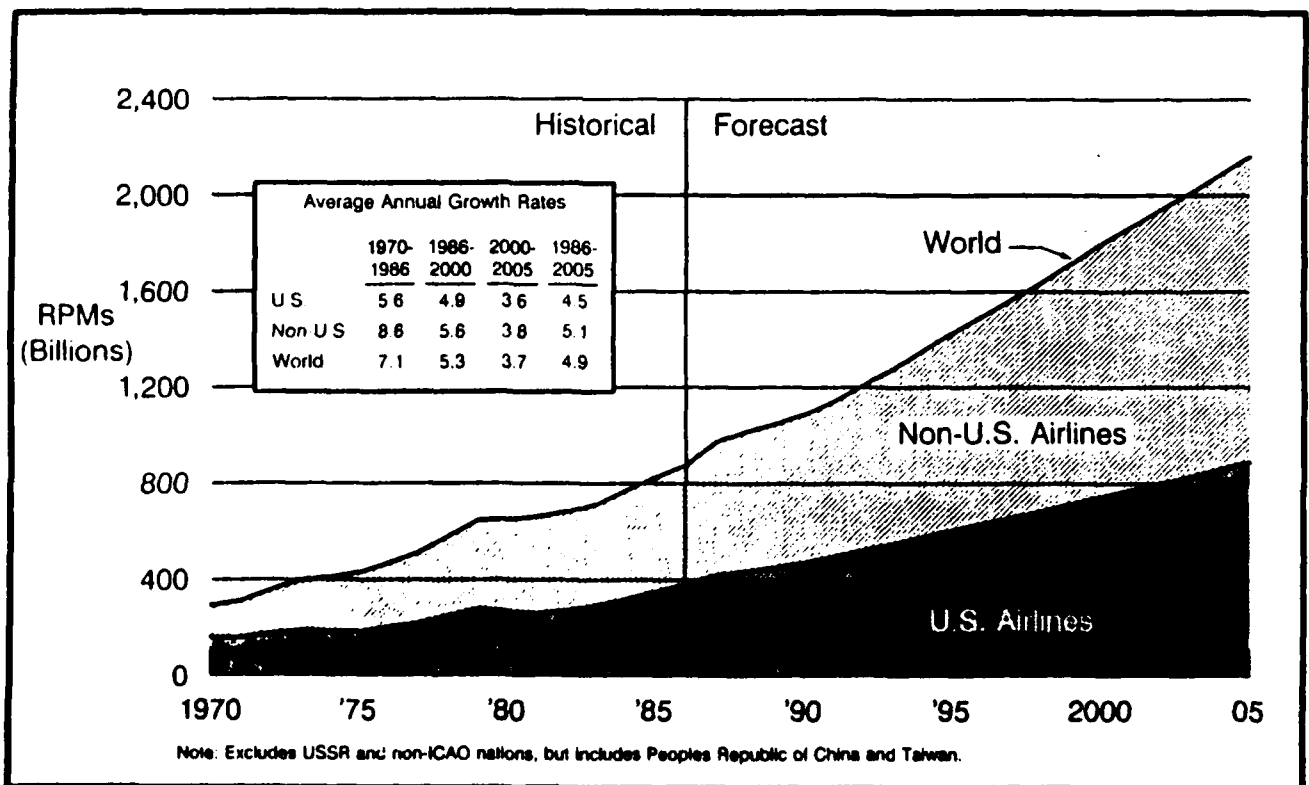
My hope is that this paper is written plainly enough to excite the reader as much as it has the writer. I have written in the first person for clarity, and I ask the reader's indulgence. The logic is not generally included in conventional wisdom and my goal is to convince the reader of

this subject's importance to the nation through plain-language explanations.

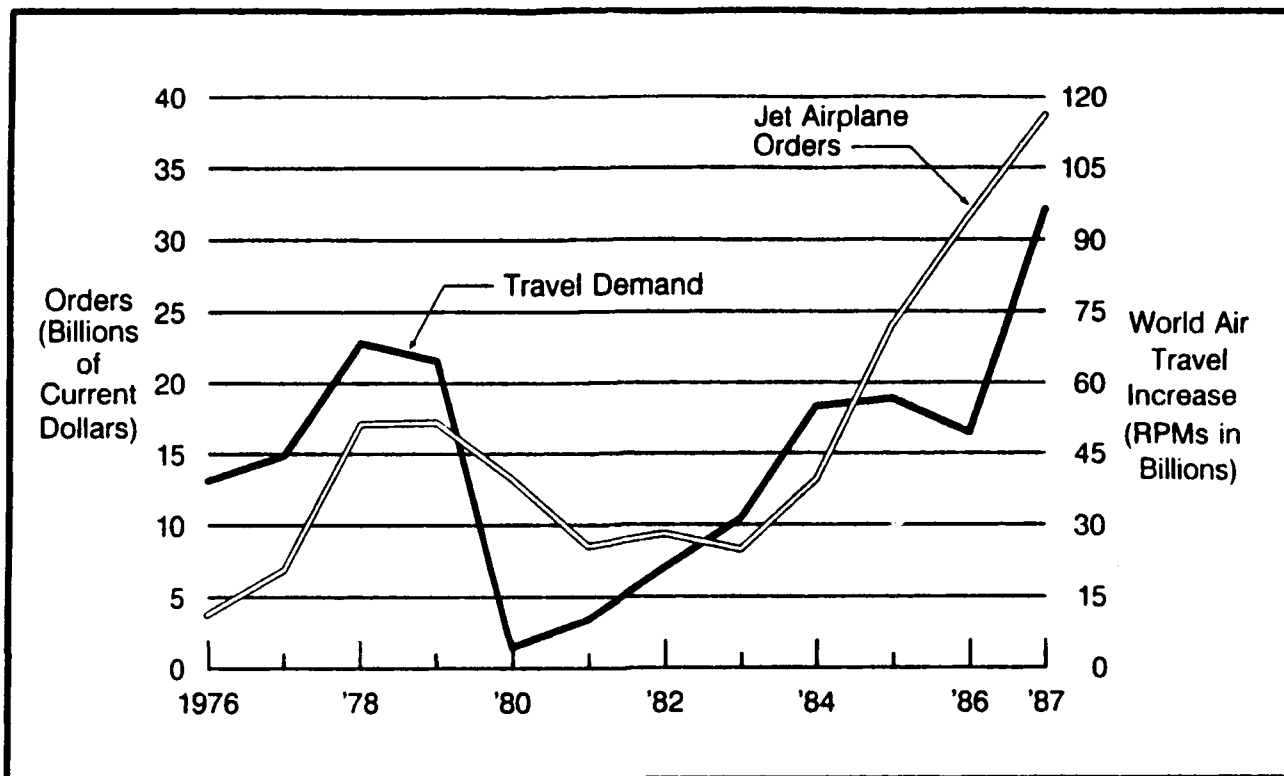
There is a real window of opportunity. Airlines are healthier than they have been since before deregulation of the industry in 1978. The airlines generally are in much better financial condition than when I last studied them in 1982. Aircraft are being ordered at a pace where Douglas and Boeing keep having their "best years" ever. Charts from the Boeing Commercial Airplane Company illustrate the upbeat commercial market.

## World Revenue Passenger-Miles

### All Services



## World Commercial Jet Airplane Orders vs. World Air Travel Demand



The Washington Post reported this month (March 1989) that even the optimistic estimations above (and shown in Appendix 4) are having to be increased.

Boeing has increased its forecast for the number of commercial jets to be sold worldwide during the next 16 years. The company raised its forecast by 22 percent for the period. . . . The bulk of the orders is expected to come from growth in the airline industry. The company is forecasting airline traffic to double by 2005. If the Boeing forecast is accurate it means the world's aircraft manufacturers can expect to split some \$420 billion in orders. Airlines would be expanding their fleets by more than 50 percent, putting 11,800 airliners into the air compared to today's 7,200. (2:2)

The opportunity is there and I will endeavor in this paper to show how best to take advantage of that opportunity.

In 1982, I published a paper titled "Defense Airlift--A Way to Increase Defense Airlift." It won honors as the top paper produced at Air Command and Staff College that year. It also won the Air Force wide "Business Research of the Year" award, and was published in short form in the Air Force Journal of Logistics. I was very excited about the potential it showed for increasing defense airlift by taking advantage of market forces and leasing laws. It seemed that decision-makers also shared that excitement as the paper wound its coordination path through the various staffs. Unfortunately, by the time the paper was read and understood and the Department of Defense could begin to move toward its implementation, Congress passed legislation which closed the window of opportunity it documented.

This year I am again excited, but this time that excitement is tempered with a feeling of urgency and a fear that again we may wait too long to act on the opportunities. For that reason, I have attempted to lay out the concepts plainly, logically, and with as much force as possible. I do not want us to lose the chance to get more airlift for the tax dollar again. The window of opportunity is open, but it requires quick action. Market forces constantly

change, and we must be ready to take advantage of movements as they occur.

The reader cannot jump straight to the proposed ideas, though. He must first understand how the government has tied itself logically and historically to the airline industry, a procedure that has provided numerous benefits from both industrial and governmental perspectives. The object of the next chapter is to document these points.



## CHAPTER II

### THE IMPERATIVE FOR CIVIL-MILITARY AIRLIFT PARTNERSHIP

This paper is based on the premise that military aircraft and the commercial airlines share the responsibility for airlift during a national defense emergency. The reader must understand that point, or the rest of the analysis is impossible. The short truth is that the United States cannot successfully go to war without the nation's airlines.

Since this is true, those of us charged with planning wartime airlift have to be concerned not only with the health of the U.S. airline industry, but with its composition. When we go to war, will we do it with the mix of military aircraft and civilian aircraft that are needed for victory?

Military planners preparing for World War II, concluded that the nation's airlines should be considered national assets. The Federal Aviation Act of 1938, therefore, provided for ". . . an air transportation system properly adapted to the present and future needs of the foreign and domestic commerce of the United States, of the Postal Service, and of the National Defense." (emphasis added) (1:18). This was not a new policy, but rather a formal statement of the policy toward commercial airlines

that had successfully positioned the U.S. as the leader in world aviation.

### The Early Years--Mail Contracts

Direct government involvement had begun in 1916 with contracts for airmail service. (1:3) Many consider the early mail contracts to have provided the one essential element in the creation of a robust airline system in America. The Post Office ". . . remained until 1934 the one government agency significantly involved in domestic and international operation." (1:6) In 1925, Congress passed the Kelly Act to provide an equitable way to award contracts for mail among the expanding number of air carriers. Three commercial airlines that may owe their existence to government contracts (not to say "subsidies") under the Kelly Act were United, American, and Trans World. (1:7)

There was a plethora of legislation over the airmail issue, and by 1929 the government's role in subsidizing the fledgling airline industry was generally accepted. In Europe, airlines were clearly subsidized in addition to airmail contracts. Of the European airlines' \$22 million total revenue in 1930, 75 percent was direct subsidy, with 13 percent from passenger fares, 7 percent from express packages, and only 5 percent from mail contracts. (3:65) Because of direct subsidies, European government expenditures per mile were \$1.50 to \$2.00--compared to U.S. government expenditures (all mail contracts) of less than

\$1.00 per mile. (3:66) Without airmail contracts, the U.S. industry would have floundered, but it retained a high competitive advantage over the other world airline systems.

Inevitably, the airlines fought over the lucrative airmail contracts, and in 1934, backed with allegations of "collusion between the mail carriers and the Post Office" it came to a head. (4:82) In a well known, perhaps infamous, chapter of Air Force history, President Roosevelt canceled all airmail contracts with commercial airlines and gave the Army air arm the airmail job. Ill-prepared for the task through training, by lack of equipment, and hindered by exceptionally bad weather, the military pilots failed.

When the task was given back to the commercial carriers, it provided the first clear example of the imperative nature of the civil-military partnership. Briefly stated, there are tasks for which military aircraft are best suited, and there are tasks at which the commercial sector excels. These are not competitive, but complementary. Both military airlift and commercial airlift are national assets. To have an effective national airlift system, President Roosevelt found to his chagrin he needed both. That logic remains today, and the national responsibility to nurture both systems has not diminished.

Unfortunately, though, another "lesson" was learned by the Roosevelt administration--that support for the national airlines, when labeled "subsidy" by Congress,

brings friction over this issue. The friction too often puts the airlines, the executive branch, and Congress at loggerheads. The situation is unfortunate, since it makes a national airlift policy extremely difficult to develop.

By 1938, growth had:

"changed the underlying character of U.S. airlines, transforming them from a collection of ramshackled contract mail-haulers into genuine common carriers. Inevitably, the transformation brought with it a host of problems, not the least of which was the lack of a Federal statute that recognized the carriers' new status. The Civil Aeronautics Act of 1938 reversed that lack. . . ." (4:iii)

One result of the 1938 Federal Aviation Act was the creation of the Civil Aeronautics Administration, part of which was the Civil Aeronautics Board (CAB). These molded the airline industry by setting fares, granting routes, setting safety standards, allowing new airlines to operate (certification) and in general regulating the airline system, promising "to promote their orderly growth with a minimum of competition." (5:iii).

That system remained until 1978, with airlines applying to the CAB for routes and fares, and the CAB attempting to foster the sometimes conflicting goals of efficient air service and free enterprise in this volatile air transportation industry. In 1978, we decided to "deregulate" the industry, and the plan may prove successful in the modern airline industry environment. We must not forget, however, that the strong U.S. airline industry

developed under government control and would probably have been otherwise impossible.

In summary, the early beginnings of the air transport system were unsettled, with many lessons learned, forgotten, and then relearned. The most important lesson may have been the government's inextricable ties to this "special" industry.

The first twenty years of the airline industry included a progression from direct governmental promotion and operation, to haphazard expansion and uncontrolled corporate warfare, to abrupt disavowal of executive branch responsibility and, finally, to regulation by an ostensibly independent agency. (1:23)

#### Preparing for Wartime Partnership

Going into World War II, one could characterize the civil-governmental airlift system in two key and conflicting terms: "acrimony" and "policy instrument."

Acrimony describes the relationship between Pan American Airlines (the only U.S. airline flying international routes prior to World War II), and the government, still rankled after the 1934 airmail feud. Pan Am started as a company which carried mail to South America. (3:70) In developing its structure, it went through three stages, first developing the South America route structure, then flying its "clippers" in support of U.S. Navy expansion in the Pacific, and finally developing a transatlantic schedule. As it developed its international system, it ensured sole rights to service critical countries. Therefore, it could charge a

premium for its mail carrying duties. By 1939, Pan Am was paid as much in mail subsidies as all the domestic U.S. airlines combined. (1:35) This led to strained relations (acrimony) between Pan Am and the government over its monopoly of an airlift system that was beginning to prove critical to war preparations.

Policy instrument, however, is the second term that describes civil/governmental airlift relationships at the beginning of World War II. The government needed Pan Am as an instrument to accomplish international goals. Although the airline had no official status as a "chosen instrument" like European airlines, (which still in 1934 had three fourths of their costs subsidized by government funds) (6:73), Pan Am was still used by our government to achieve national objectives. In 1939, for instance, Pan Am was given government money to expand its South American operations to compete with the Nazi-supported Colombian airlines, "Scadta." (3:71) This plan was successful, and the German influence was contained. (1:35)

Later, when the Allies needed a system to transport aircraft from the U.S. to Britain, Pan Am did the job, delivering 464 airplanes by the end of 1942. On the other side of the world, the "Hump" airlift between China and India was also assigned initially to a Pan Am subsidiary which carried 75 per cent of the first month's cargo. (1:51) As the war effort increased, all the major U.S. airlines contributed, but their initial use was treated with mistrust, a real

love-hate relationship that continues to characterize this nation's relationship with its airlines today.

### **Melding the Two Systems for War**

During World War II, airlift operators worked so closely together that it was difficult to distinguish military from civilian. The Air Transport Command was run by a combination of military and civilian officers. In fact, its second-in-command was the President of American Airlines, C.R. Smith, who was given the rank of major general. (1:50) The Air Corps took some aircraft directly from the airlines. On May 15, 1942, the Army requisitioned almost half the airline fleet, leaving the carriers with only 176 planes, compared to 354 six months earlier (5:88) It should be noted that the remaining civil aircraft still produced large profits for the airlines during the war (4:88)--again symbolic of a symbiosis between military emergency and airline health.

The combined civil-military wartime operation has been lauded by both sides. Perhaps the most notable consequence of the combining of the civilian and military airlift systems was the evolution of the U.S. airlines during the war from U.S.-only carriers to truly international carriers. After the war, our national airlines found that long range airlift aircraft were available, routes had been established, pilots were available and trained, airfields

were available, and demand for international passenger movement was high. The United States emerged from the war years with a substantial airlift potential which our airlines moved quickly to realize. "In the long run, the war greatly accelerated the growth of peacetime civil aviation." (5:84)

### **The Uneasy Post-War Period**

We also emerged from the war with the assumption that in future wars the airlift system would again be "nationalized" to the mutual benefit of commercial business and national defense. Although this assumption is no longer accepted, and no one expects our airlines to completely merge with the military during war, new systems have been established to ensure both the military air transportation and the civilian air transportation systems survive the traumas of the next war. It is extremely important that we not lose sight of the enormous advantages of cooperation and mutual benefits both the airline industry and the nation's warfighters realized during the World War II experience.

I have already mentioned the Berlin airlift and the Korean War which followed rapidly after World War II. In neither of these great airlifts did we have to take the extreme measures of combining the civil and military systems. There are two reasons we did not have to repeat the World War II experience. First, by this time we had active international fleets in the civilian inventory, representing an airplane surplus never again to be seen in the industry. The



second reason is that the airlines were very willing to provide the support desired, as long as they could avoid the potentially disastrous results of nationalization and be reimbursed for their cooperation.

### Conflict With The Airlines

The mid-1950s brought a change. The airlines, in an era of increased competition, kept viewing the airlift of military equipment as a vital source of funds. Two recent wars and the Berlin airlift had provided impetus for the industry, but where was that impetus during peace? In fact, every piece of cargo carried by the Military Air Transportation Service (MATS) meant one less piece for the commercial carriers. This led to Congressional scrutiny of the system and restrictions on how much peacetime military airlift business the commercial airlines should be given.

In 1957, Congress mandated that 20 percent of all military cargo and 40 percent of all military passenger business must be given to commercial carriers, even if military transports had to fly empty on the same route. (1:155) In 1958 and again in 1959, a portion of defense appropriations were earmarked solely for procuring civil airlift for routine military cargo and passengers. This applied, of course, only to peacetime traffic.

### The Forming of CRAF

At the same time, a solution to the wartime traffic problem was being institutionalized. It is called CRAF, the Civil Reserve Air Fleet, since 1952 symbolic of a new civil-military partnership. CRAF, based on a series of interagency agreements and contracts, has provided a viable and profitable substitute for nationalization. The CRAF has evolved into a rather complex system involving three graduated call-up stages, and four segments (or missions). Airlines who sign contracts to participate in the CRAF are rewarded with peacetime government airlift business. Today, there are 276 passenger aircraft in the CRAF inventory, representing 158 million passenger-miles per day, and 99 cargo aircraft representing 13 million ton-miles per day. (7:2)

An important observation is that no stage of CRAF has ever been implemented. As in Korea and Berlin, the industry is extremely anxious to let normal contracts, rather than a national call-up, determine how cargo and passengers get to the war zone. The CRAF system is designed for a national emergency but so far no emergency has required a CRAF call-up. They could all be handled through regular government contracts for airlift augmentation. In those instances where there has been a need for civil augmentation of the military airlift system (as in the critical stages of the Vietnam war), the airlines have done their share without activation of CRAF.

### Recent Changes in the Partnership

The preceding sections of this chapter have outlined the nature of the current airlift system. The characteristics have not changed radically in the last decade and a half, but several refinements need to be listed in order to round out our understanding of the current airlift environment.

1. Airline Deregulation--1978. The Pan Am monopoly of international airlift was broken after World War II, but the Civil Aeronautics Board still acted as approval authority for granting both routes and fares. This applied both domestically and internationally (although the State Department negotiated international agreements through "bilateral treaties").

In 1978 this system changed, and the CAB was put on a schedule to discontinue its operations (Sunsetting). Deregulation has led to many changes in the civil airline industry. At first there was an overabundance of new operators eager to compete for lucrative routes. "Deregulation brought with it a host of new airlines, and the pressures of operating in the competitive environment have winnowed the number of operators. The U.S. industry comprises 78 airlines operating as scheduled air carriers. This compares with 36 certificated airlines before the 1978 deregulation." (8:84) Now the system seems to have settled down to a list of "mature" airlines which have merged for efficiency, which have linked themselves with regional carriers, and which operate more

efficient hub-and-spoke systems. Eight major carriers now control 93 percent of the U.S. market. (8:84) The point is not that deregulation was either good or bad. It does, however, highlight the last ten years as turbulent ones, which have produced larger and stronger scheduled airlines. An unexpected blessing from deregulation is the increase in the average size of our airplanes (more wide-bodied). To realize economies of the deregulated system, and considering the crowded airport and airway situation, airlines are looking at larger aircraft. (9:45)

2. CRAF Enhancement. This idea spawned because of the need to create cargo, rather than passenger, capability in the civil fleet. Defense planners saw that CRAF could move the soldiers to the battle more rapidly than they could move the soldiers' equipment. Thus, more cargo capacity was needed. CRAF enhancement called for the modification of passenger aircraft to be rapidly convertible to cargo configuration during war.

So far, the government has contracted with four airlines to modify 23 airplanes, as shown below. These represent 3.3 million ton-miles per day capability by the year 1990. The chart is reproduced from the Secretary of the Air Force's report to Congress: (7:7)

Aircraft Type	Capability (Tons)	Term (Years)	Contract Cost
United DC-10-10	40.5	16	\$17.9M
Pan Am B-747	73.1	12	\$30.0M
Fed Ex DC-10-30	54.6	16	\$4.3M
Evergreen B-747	73.1	12	\$4.6M

The Air Staff points out that to purchase this amount of airlift would cost the government many times the amount paid for CRAF Enhancement. For instance, the DC-10-30 would cost the government approximately \$92 million to own and operate for its projected service life. (7:14) Compared to the \$4.3 million modification cost, it is a bargain.

3. Growth of the Package Carriers. Overnight delivery is an idea that has caught on in America. Federal Express, Emory Air Freight, United Parcel Service, and the U.S. Postal Service are in the business of rapid delivery of small packages. The demand is so great that the airplanes purchased to move these packages show new promise for the wartime airlift. Aviation Week and Space Technology magazine reports on this situation: "Express carriers, which seized 47% of the U.S. market in 1987, are expected to continue outpacing the growth of the scheduled airline cargo operations." (19:114)

"These are the new freight airlines of the world." says Mr Jay Woodworth. (11:2) Unfortunately, they are not

good targets for traditional CRAF business mainly because these companies do not need military business. Additionally, the requirements we require for a carrier enrolled in CRAF do not fit the package carrier situation. For instance, they have a lower crew ratio than the required four-crews-per-airplane. Even worse for defense, their air freighters are often not compatible with standard military loads. So, the Military Airlift Command is reported to be working very hard to capitalize on the capacity represented by the package carriers. MAC "stands to lose out on 5.66 million-ton mi./day of additional cargo carrying capacity by the year 2000 unless it can accommodate these types of operators in the program." (8:181)

One of the aims of this paper is to show ways to capture the new freighter capabilities of the package carriers for national use during war. It is especially important considering the recent \$880 million acquisition of "Flying Tigers Line" by Federal Express Corporation. Flying Tigers operates some of the most important cargo aircraft in the CRAF. "Flying Tigers perennially is awarded the largest amount of CRAF business, more than \$100 million from the commitment of 16 Boeing 747 cargo aircraft. . . ." (12:51) It is imperative that we not lose this capability as the Flying Tiger assets are moved into the Fed Ex system.

4. Growing Pacific Market. The emphasis of the airlines is shifting west. Pacific traffic is the most

rapidly expanding in the business, and is expected to grow 8-10 percent through at least 1995. (13:113) There are definite military implications to this move. On the favorable side, distances in the Pacific require airlines to operate the long range wide-bodied airplanes preferred by military planners. On the negative side, because range is so critical, few airlines are eager to trade fuel for the extra weight the military wants airliners to have in order to be convertible to cargo. Mr Jay Woodworth of Bankers Trust Company is a leading analyst of the airline industry and particularly the Asian market. He recently wrote me:

You must be alarmed by the hardware orders. According to my (quick) check, the only 747s the U.S. airlines have on order are 747-400s, and no one would "currently" give any thought to any modification that would reduce the range of those planes. The airlines have transpacific and intra-Pacific routes that require the 400s. The loss of only a few hundred miles in range would mean that some routes could not be served. Given the prevailing per-seat mile revenues in the Pacific, this is big bucks for the airline! (11:1-2)

Thanks for those words, Mr Woodworth. You've identified a major challenge for the military and the CRAF system.

5. A National Airlift Policy was published on June 24, 1987 for the first time. It replaced the Presidentially approved Courses of Action which had directed the civil-military airlift partnership since 1960. This Presidential document identifies the national airlines as critical for defense of the nation and charges the department of Defense with insuring the civil fleet will meet defense needs. The

document establishes clear guidance for the government in its development of defense features in the nation's civil aircraft fleets. The Policy is attached to this paper as Appendix I.

### Summary

This chapter has brought us up-to-date rather quickly on the current civil-military airlift partnership. It is unfair for any author to recite history without drawing conclusions for the reader, and I will not let the reader down in this regard. Hopefully, the lessons are obvious, but for the sake of consolidation, I would say that the following are the "lessons" of the history of airlift in the United States:

1. Even in periods where the government attempts to become uninvolved, or to deregulate the airline industry, there remains a requirement for governmental action or the airlines languish.

2. Military airlift aircraft are specialized to a military mission and are essential to defense plans. However, the amounts to be airlifted during war require the use of the nation's airlines.

3. Stronger airlines increase the potential for passenger airlift during war, but cargo capability has historically lagged this capability. Since we have more passenger capability than cargo capability, there are continuous plans to convert airlift from passenger to cargo. As we execute these plans, we should be always on the lookout for more economical ways.

4. The one central point is that airlift is a national resource. Some of it is in the civil sector and some of it is represented by organic military aircraft. The nation must plan on the efficient use of both sectors.



This chapter has established the importance of the partnership. The next chapter will go into the partnership system itself.

### CHAPTER III

#### THE LOGIC OF AIRLIFT

The last chapter traced the development of the national airlift system. We saw that government is the unavoidable major factor in determining the health and effectiveness of the U.S. airlines, both in peace and in war. The next challenge is to understand the nature of the commercial and the military systems. If we can isolate the key capabilities of each system, then we will be better able to recommend ways to make the system more efficient:

#### Point One: More Cargo Lift is Needed.

The question of how much airlift the nation needs has been an elusive one. In 1981, Congress, frustrated at trying to provide funding for mobility programs without knowing what the requirement was, ordered a mobility study. It took thirteen months to complete, but when it was published, the "Congressionally Mandated Mobility Study" became the most authoritative and generally accepted standard to determine the airlift requirement. It used scenarios in three different parts of the world to determine airlift requirements. Results were sobering. "While the exact numbers remain classified, in general the study showed that today's mobility forces will meet only one third to one

fifth of the lift needed in the first 15 days of such contingencies." (14:31) Speaking in civilian airlift terms, the study recommended that 32 Boeing 747 equivalents should immediately be added to the CRAF program in addition to the 67 that were in the program at the time. (14:31)

As a result of the Congressionally mandated Mobility Study hearings in 1982, 66 million ton/miles per day (MTM/D) has become the accepted national airlift goal. During the hearings it was acknowledged that the 66 MTM/D figure would not meet the actual airlift requirement of any of the study scenarios. However, the figure was believed to be an obtainable goal and one which the Congress and the Military Airlift Command have used to analyze progress.

Of the total airlift capability in 1989, 16.2 MTM/D will be provided by commercial carriers through participation in the CRAF program. The CRAF Enhancement program (where the government pays for modifications of commercial aircraft to provide cargo capability) represents 3.4 MTM/D of the total. (15:4) Still, the military and the civil sectors, even with CRAF Enhancement, will fall short of the 66 MTM/D goal until the C-17 is deployed.

The point is that we have a goal--66 million ton-miles per day. That number is far from "enough," but it has been accepted as an achievable goal. The commercial sector contributes significantly to the total, but there is a need to increase the nation's combined cargo airlift capability. General Duane H. Cassidy, Commander in Chief of the United

States Transportation was quoted recently as saying that ideally, the U.S. needs to expand its capacity into the 75-125 million-ton-miles-per-day range. "If we had 125 million ton miles, I could make the [commanders-in-chief of unified commands] around the world some guarantees I can't make them today." (41:24)

On the other hand, the nation's passenger airlift is in good shape, primarily due to the excellent international airlift capabilities of our airlines. We have to convert CRAF passenger capability to cargo capability, and the CRAF-MAC partnership is certain to go through some fundamental changes as MAC struggles to attract the needed cargo capacity to the civil reserve fleet.

Point Two: Commercial Airlines Carry a Large Proportion of Total Wartime Airlift. The latest analysis shows the commercial segment will carry 95% of U.S. passengers (troops) in a war scenario, and 24% of the cargo. (Apendx 2)

The passenger side of the equation is an interesting one. It is generally accepted that the nation has no deficiency in passenger airlift. While this is much more the case in passenger lift than in cargo lift, one should still note that as cargo lift goes up, so does the demand for passenger lift. (The planner does not need the materiel to get to the war before the people who are going to use it.) Soon, you get to the point where cargo lift should not be

increased until passenger lift is addressed. The formula shows that it would be counterproductive to convert all the nation's impressive passenger lift to cargo. We need the passenger capabilities of the nation. What is needed is a careful consideration of how much cargo lift is needed from the commercial sector and how best to get it--without cutting our advantageous position in passenger lift.

Point Three: We need a Mix: passenger and cargo, civil and military. The "National Airlift Policy" signed by President Reagan on 24 June 1987 "... does specifically mention and reinforce the equal and interdependent nature of civil and organic military airlift resources in satisfying the nation's requirements for defense airlift." (15:1) In fact, it can be argued that the document derives from the need to clearly state the importance of each sector--civilian and military--in national defense. A main thrust of our National Airlift Policy is the need for a mix of civilian and military assets. Neither can do the job of the other. As the Military Airlift Command puts it:

An efficient program is one that gets the most airlift for the dollar. However, the government cannot acquire added ton-miles without regard to the operational characteristics of the aircraft which generate those ton-miles, and the DOD cannot rely solely on commercial aircraft to satisfy defense airlift requirements. Commercial aircraft are different from military airlifters in important ways. They are the most efficient bulk airlifters in existence, but business considerations played a major part in their design, and this design affects their utility in a military operation. A wing which maximizes cruise efficiency may also be poorly suited to operations from shorter runways.

A cargo deck which is 15 feet off the ground is impractical at numerous airfields, some of them relatively remote, which efficiently support a major military deployment.  
(15:3)

The National Airlift Policy recognizes the need for both commercial and military-organic aircraft. As we saw above, there is also a need to maintain the mix of passenger and cargo capability in the nation's resources. The main idea of this discussion is that there are no easy formulas for us. With limited mobility dollars, we have to carefully balance the equation to continually maximize what the combined fleet will give the American citizen.

Point Four: The most efficient military solution is the most costly. Conversely, the most cost-effective solution doesn't meet military needs.

Let's assume we will meet the 66 MTM/D goal in the year 2000. We know the goal is a fiscally constrained one--which means we're still short of the requirements of any studied scenario. This is important because the question remains: "What percentage of the 66 MTM/D goal should be military airlift and which should be civilian (CRAF)?" If 66 MTM/D were "enough" airlift for our scenarios, the question might be answered differently. As it is, since the number 66 MTM/S is a constrained one, it would seem to make sense to procure the most inexpensive lift we can as an excess.

If all the new airlift were military, flexibility would be maximized, and so would efficiency since our military airplanes are more efficient cargo haulers. There are additional economies in that we would not have to preposition expensive ground support equipment (high-lift), unique to the civilian airplane. However, this is overall an extremely expensive option. First, the taxpayers have to buy the aircraft, pay the crews, and buy fuel, maintenance and a personnel support structure. Second, when cargo is carried by the larger organic fleet during peacetime (It would be wasteful to fly these airplanes empty during training legs), it squeezes out cargo to be carried by contract airlift. The current \$662.8 million of military airlift given to civilian contract airlines each year would be cut back, and commercial carriers would not require as many aircraft. In short, it would carry a large direct dollar cost, and would also create a loss of commercial airlift capacity.

On the other hand, adding aircraft to the CRAF program is much less expensive. Some specific military airlift missions (like strategic airdrop) would have to be curtailed. Furthermore, to get the required airlift for even a minor contingency would require a call-up of at least a portion of CRAF. This would be extremely disruptive to the commercial system. It would also be very costly:

The DOD flies the MAC fleet to support the readiness of the airlift system. Whether or not MAC aircraft carry cargo, they will fly, and the DOD must pay for those flying hours. . . .If all cargo were moved by civil aircraft, the DOD would pay for this movement and for the empty military flights, thereby dramatically increasing the cost of maintaining a military airlift capability.  
(15:11)

Proponents of all-CRAF and all-military solutions are both wrong. We need a mix. I emphasize this point because the suggestions I make in later chapters might be considered by some to produce an "excess" of CRAF. There is no "excess" when we talk about the 66 MTM/D, because that figure understates the problem of any of the scenarios it studied. Improvements in the MAC-organic fleet, especially the purchase of the C-17 are vitally important. Simultaneously, improvements in the civil program do not crowd out C-17 opportunity. Both are needed and both may be vital to national survival. We need all we can get of both.

Point Five: Airlift Shortfalls occur in bulk, oversize, and outsize categories, some of which cannot be carried by any commercial airliner. Very quickly, "bulk" cargo is that which can be combined on a standard military pallet. Oversize cargo is too bulky for standard commercial cargo airplanes, but can be carried on a military C-130 or C-141. Outsize cargo is too large for the C-141 but can be carried on a C-5 or C-17. Commercial augmentation helps the bulk problem. A hidden benefit is that in so doing, the C-141s, C-5s, and C-17s can be maximized to carry cargoes



which require their specialized capabilities.

Often one hears the argument that the shortfall is in oversize or outsize cargo, so increased CRAF is useless. I would point out that C-5s are currently planned to carry all three categories. The basic reason is timing. Some of the bulk cargo needs to get to the theater before some of the outsized cargo, so the C-5 carries the bulk. This is obviously less than optimized use of the one outsize hauler (the C-5) currently in the inventory. Commercial augmentation relieves this pressure and streamlines the airlift operation.

Point Six: Some airplanes have special ground handling requirements. This is an important note because all airfields are therefore not created equal. A C-17 advantage is that it has few ground requirements, and can operate from short runways, near the battle ares. CRAF aircraft require special equipment for loading. This restricts their use to selected fields where, as mentioned earlier, offload equipment has been pre-positioned.

### Conclusion

I selected the six "points" of this chapter because they are critical to the airlift algorithm. There is no best airplane for emergency airlift, but there is a best mix. Since we are striving to obtain 66 million ton-miles per day of airlift, and since that will still not meet the warfighter's needs, we should encourage any program to

increase our overall capability. All this points to the fact that creating cargo capability in our U.S. air fleet is the crucial element. We should concentrate on converting some judicious amount of passenger lift to cargo; but even more importantly, we should be constantly poised to encourage the U.S. carriers to purchase cargo airplanes.

## CHAPTER IV

### CURRENT CRAF ENHANCEMENT PROGRAMS

This chapter traces the development of the Civil Reserve Airlift Fleet (CRAF) Enhancement Program. The program spends tax dollars to buy defense modifications for commercial airlines. The goal is to convert some of our commercial passenger capability to cargo capability during war. This chapter shows that the program has met with mixed results, but that it reflects continued Congressional interest, and that improvements are possible.

#### The First Program - 1979

In 1979, Congress recognized the need for a plan to tailor the U.S. commercial air fleet to meet defense needs. The resulting legislation providing for modification of new widebodied passenger aircraft as they were being built. The modifications would make the aircraft convertible to a cargo configuration during a national emergency. Only one carrier, United, with only one airplane, a DC-10-10, ever participated in this first CRAF Enhancement program.

The government paid for the extra costs of putting in the features for cargo--mainly a strengthened floor and a cargo door. We also paid for lost revenue due to the extra production time. Finally, the government paid the airline for a fuel penalty due to the extra weight the aircraft

would have to carry. Still, it was a bargain for the taxpayer. We got a large amount of airlift for a fraction of the cost of buying and operating a military airlifter. The cost to the government was a one-time \$15.8 million dollars, and the guaranteed life of that airplane in the CRAF fleet is sixteen years.

No other airline, though, offered any other new aircraft, and the United DC-10-10 stands as the single example of a system that had a large potential for impacting the wartime airlift equation. Airlines were not buying many aircraft in the early '80s, as this was a "slump" period. They were also afraid that the extra weight of the modification would make a modified aircraft difficult to sell. Finally, they were worried about the restrictions in the system, especially those that precluded the airline from using any of the new cargo system, or selling the aircraft to someone who wanted to use the cargo features for peacetime commercial operations. Since the CRAF Enhancement program failed to generate new aircraft for modification, military planners began examining the cost-effectiveness of modifying older passenger airliners to include cargo-convertible features.

#### **CRAF Enhancement Two--Retrofit**

The result was the Pan American Airlines contract, which will eventually place a total of 19 modified Boeing

747-100s and -200s into the U.S. civil inventory. (Now 18, since the fatal Pan Am flight 103 was one of our modified aircraft). Modifying existing aircraft is a more expensive proposition than modification during production. Existing aircraft have to be taken out of service, and the government pays for the very expensive down-time, besides the very expensive modification and weight penalty costs. At \$30 million each, though, the taxpayer again got a lot of airlift for their money. The attractive feature is that those aircraft are used daily and maintained to the point of being always ready, and it is done at no expense to the government. Again, the owner is forbidden to use the cargo features, or he forfeits a penalty.

The first two chapters of the CRAF Enhancement story created substantial increases in our ability to meet the Congressionally Mandated Mobility Study goal of 66 million ton-miles per day (66 MTM/D). Perhaps more importantly, they demonstrated the potential increases in airlift if smart managers worked hard at maximizing airlift for the dollar.

#### CRAF Enhancement Three--The Fifty Percent Rule

So, in 1986, those smart managers worked with Congress to produce a further refinement to the program. The modifications discussed above were to passenger aircraft, and in fact the operators of those aircraft were prohibited from using the cargo features the government had financed.

The reasoning was that if the carrier was going to buy a cargo airplane anyway, the government shouldn't be responsible for its cargo modification costs. This logic was understandably frustrating to the cargo carriers who said, "Hey, Uncle Sam, when you go to war it is my airplanes (cargo aircraft) you really want to use first. They are cargo configured and ready to go. Why are you paying passenger carriers to fly convertible airplanes and do nothing for us who are already flying the planes you want?" They were right, and in 1986 Congress passed public law 97-86.

Public law 97-86 restated Congressional support for the CRAF Enhancement program and allowed a new category of participant--the carrier who wanted to modify a passenger aircraft and operate it in the cargo-convertible configuration. Congress recognized that the government should not pay for all the cargo features of any such aircraft, but that to encourage the operator to purchase cargo capability, the government would pay 50 per cent of the modification cost only. The carrier was not reimbursed for a "weight penalty" as in earlier programs, and the modifications cost much less as a consequence.

In my opinion, the "50 per cent rule" is the biggest step forward in logic since the inception of the CRAF program. For the first time, the government is acknowledging that it has a role in encouraging air carriers to operate the airplanes we want for national airlift assets. We are

not just using public funds to buy capabilities of little interest to the carrier. We are paying to help a carrier who will operate the exact airframe we want, in the exact manner we want. The only thing more attractive would be if it were a pure-cargo rather than a convertible option.

The Federal Express purchase of a DC-10-30 was the first example of the new 50 percent rule. For \$4.3 million, the government insured one of the most desirable wide bodied aircraft was placed in the U.S. inventory. My discussions with Fed Ex officials indicate they were considering at least two other DC-10-30 aircraft, but were unable to convince the government that they needed government assistance under public law 97-86. The airplanes were not purchased, and we may have missed another opportunity by being over-cautious.

Government officials are very careful about using the 50 percent rule. If a carrier will buy the airplane anyway, public funds should not be committed. Federal Express officials would point out, though, that there would be two other DC-10-30 cargo aircraft if we had participated. Instead, they bought Boeing 727 cargo aircraft that are not as useful to our wartime planners.

Finally, the most recent participant in the 50 percent rule is Evergreen Airline, which is contracting to modify existing Boeing 747s under the rule.

## New Legislation

This year the Department of Defense has recommended to Congress a change in Public Law 97-86 to provide for inclusion of defense-necessary secure communications, range enhancements, and Identification Friend or Foe (IFF) units on selected long-range CRAF aircraft. They estimate that \$2 million will allow them to provision up to 40 aircraft a year with these critical features. (7:11) It also proposes that the DOD be granted the:

. . . flexibility to be able to work toward the modification of civil aircraft to incorporate cargo-convertible or cargo-capable features to increase the long-range cargo capability of the CRAF. This would be done by DOD participation in the building of new aircraft, or the modification of existing aircraft to any of the cargo-capable configurations--freighter, convertible, or combi. (7:10)

Congressmen have given favorable reviews to the program. It was clear in the Appropriations Bill language that they encourage an expanded CRAF. Public Law 97-86 is another step that recognizes the potential for high payoffs in the civil airline industry. The disadvantage of this program is the same as earlier CRAF Enhancements--they cost the taxpayer's money. In this paper I will be proposing alternatives that do not cost tax money.

Where has CRAF Enhancement brought us? The numbers are impressive. "When current contracts are completed in November of 1989, the DOD will have modified 23 aircraft. These 23 aircraft will contribute 3.4 million



ton-miles per day of the 16.2 MTM/D of cargo capability being provided by the CRAF." (15:4) That is almost 21 per cent of the whole CRAF contribution, or almost 7 percent of the combined civil and military wartime air cargo capability.

## CONCLUSION

CRAF Enhancement is important first because it has produced substantial increases in national air cargo capability. More importantly, it shows that great economies for defense which can be realized through a cooperative effort with our commercial airlines. It is a program which has already produced 3.4 MTM/D cargo capability that would not otherwise exist. However, there is a need to expand the concept within its logical bounds. As stated in the recent "Report to the Congress on Expanding the Scope of the Civil Reserve Air Fleet Enhancement Program,"

Despite the success of the current CRAF Enhancement Program, it is deficient in that it does not allow the DOD to participate in building new civilian aircraft or in modifying existing civilian aircraft in all of the cargo-capable configurations. . . . Additionally, it does not provide for DOD participation in the incorporation of necessary communications and navigational equipment to make civil passenger aircraft interoperable with the military airlift system. (7:7)

CRAF Enhancement is a successful program, and one whose principles are well accepted, mainly because they make good economic sense and good military sense. It has captured the imagination of defense planners and members of

Congress. As we get continually smarter on CRAF Enhancement we see new opportunities to do even greater things using its principles. That is the subject of the next chapter: how to accelerate the benefits received from the airlift leverage represented by CRAF Enhancement.

## CHAPTER V

### FIVE CIVIL AIRLIFT ENHANCEMENTS

The first four chapters have shown us that it is the government's role to insure the civil airline fleet meets defense needs. We've demonstrated that legislation exists to work toward this end. The question remains, "Are the taxpayers getting the most airlift for the money they put into airlift programs?" The question can be asked of both the military and the civil sectors, and although this paper concentrates only on the civil side, the reader should not be lulled by the words that follow into believing that the whole wartime airlift problem can be solved by creative programs in the civil sector alone.

There will always be a need for a purely military airlift system. It is needed for less-than-war emergencies. It is needed for military-unique cargoes. It is needed to get into many airfields which lack ground support equipment required by the commercial airliners. Finally, it is needed to deliver material close to the battle and into short runways. Military airlift will always form the backbone of the overall national airlift system. President Reagan made it clear in 1987:

The goal of the United States Government is to maintain in peacetime organic military airlift resources, manned, quipped, trained and operated to ensure the capability to meet approved requirements for military airlift in wartime, contingencies, and emergencies. (Appendix 1. page 1)

Following are five concepts for analysis as to how well they will complement the military system. They form the basis for the rest of the discussions of this study:

1. Continue the Current Program

There is continuing minor interest among the airlines in the "fifty per cent rule." There is no interest in the old CRAF Enhancement program where the airplane is modified at full government reimbursement, but where the plane cannot then be used in the cargo mode without the airline paying a penalty.

There are many reasons why the anticipated interest in CRAF Enhancement has failed to materialize, but the most obvious and the most important is the general health of the airline industry. Mr Jack McHale, then of Federal Express, recently wrote me a letter where he addressed the airlines' frustration over this point:

Much of this situation was fostered by the "built-in" restrictions in the current law that limited participation, stifled rather than encouraged the creation of cargo-capable lift and produced less than optimum solutions that fell far short of what would be an attractive package, both from an operator and contractor standpoint (not to mention taxpayer). The lack of (and sometimes the inverse) relationship of dollars paid for quality or quantity of lift provided has to be addressed.  
(17:1)

The airline business is in much better condition now than it was in the late '70s when CRAF Enhancement was introduced. Most airlines today are using all their capacity, and purchasing more. No airline can profitably

give up a wide-bodied airplane for the months it takes to have it modified. The commercial airline industry is however a mercurial one and in the future the situation might change. If a carrier has excess capacity, CRAF enhancement may again be a tempting option. Therefore, the CRAF Enhancement legislation should remain intact.

There are two reasons why the government should be ready to take advantage of any weak situation that may develop in the air transportation business. First, we get additional wartime cargo airlift at a bargain. Second, we help the industry through a rough period. (Hopefully this paper has convinced the reader that the health of our airlines is important to national defense). One might most accurately view the CRAF Enhancement program as a buffer. When the airlines are looking for more capacity, none of them will participate in a cargo modification program. This is the current situation. If in the future, economics lead to excess capacity, they always have the option of turning over a wide-body for modification and let the government pay for its currently unneeded capacity.

What will make legislators uneasy about the program (as well as Air Force budgeteers) is difficulty in programming the proper amount of money. CRAF Enhancement is based solely on the airline industry's future health--a definitely unpredictable question. So, we have to be able to act quickly whenever economics drive an airline to our

doorstep. The Secretary of the Air Force's report to Congress suggests funding for two modifications a year, but also recognizes the necessity of reprogramming as an option to take advantage of rapid changes in the industry. (7:12) Some of the options discussed in the rest of this chapter are also flexible and when used as a "range" of possibilities, give managers more options than just a yes-or-no question. The current CRAF Enhancement program will dove-tail with these proposals to present a more comprehensive package to achieve the goal of additional civil cargo capacity.

## 2. Weight as Cargo

This concept has been debated in government and military channels for the past three years. No special legislation exists for it, but in spite of its drawbacks, there is still a group of government decision makers and a large airline lobby who support it.

The idea is a change to the current CRAF Enhancement Program by which the government continues to pay the carrier, after his passenger airplane is modified, for the extra weight the airplane carries because of the modification. In the case of the Boeing 747, this is approximately 12,000 pounds. (12:51) Proponents of this idea would have the government pay Pan Am for those 12,000 pounds every time the airplane flew, as if those pounds were cargo--thus the name "weight-as-cargo." Their point is that since there is

little current interest in CRAF enhancement, we need to bribe the airlines to participate by offering very attractive rates.

Although this makes sense to the airline, it appears to this author to be going overboard. Do we really need to provide this much motivation for the airlines to participate in CRAF enhancement? We have already seen that the health of the airline industry is what mainly determines participants. In a robust growth period, even weight-as-cargo might not be enough to motivate airlines to participate. In a down period for the industry, current CRAF Enhancement provisions are probably enough.

Cargo movement costs money because of extra fuel consumed to carry the weight, and because of lost opportunity on critically long legs to carry passengers or other cargo. These costs are incurred by the airline when the airplane is modified with extra weight under CRAF enhancement, and the argument goes that the weight should be reimbursed at a rate of the cargo which was displaced.

I would respond, first, that those critical legs are rare. I would then point to the other costs of carrying regular cargo, which cannot be applied at all to the CRAF modification. These costs include processing the cargo, transporting it to the airplane, loading it, securing it, unloading it, breaking it down, communications for tracking it, communications for announcing its arrival, processing it at the destination, and delivery at least to a pick-up

point. None of these costs are incurred by the airline flying CRAF-modified airplanes, and the taxpayer should not have to pay for a cargo weight that takes all this into account.

The current CRAF Enhancement legislation (Public Law 97-86), allows for the government to pay for the extra weight in one of two ways: by a one-time payment or by yearly fees (not weight-as-cargo). ". . . the Secretary shall make a lump sum or annual payments (or a combination thereof) to the contractor to cover any increased costs of operation or any loss of revenue attributable to the inclusion or incorporation of cargo-convertible features suitable for defense purposes in the aircraft." (18:1127) Advocates of the weight-as-cargo concept believe the law allows it. However, the clear implication is that the drafters of the law figured on something less than paying for the modification weight as if it were cargo.

Weight-as-cargo is an unreasonable idea. But should we completely throw out the whole concept? Earlier, I noted that DOD could manage the CRAF enhancement program better if the program were more flexible. Weight-as-cargo is an example. No, we do not want to pay for the extra weight at the regular cargo rate; but, that doesn't mean that we fail to recognize the penalty the airline pays for operation of a heavier airplane. So let's negotiate. If you have an aircraft you are considering entering into the CRAF



Enhancement program, we will consider a mileage charge for the extra weight. It should be much lower than the regular cargo charge, though. As the military manages the overall CRAF program, a program we might call "weight as bargain cargo" could be a negotiated option.

### 3. Joint Use and Base Access

In December of 1988, the Chairman of Federal Express, Mr Fred Smith, proposed that the government grant his company permission for regular landings at El Toro Naval Air Station, California. This is the latest in a list of proposals for military fields to be used for commercial operations. Often, there is logic to the proposal, but it is almost always considered by the military to be a one-way street to the advantage only of the commercial carrier.

I would submit that is an inaccurate view. Facilities built by a cargo airline, for instance, might prove to be a huge wartime advantage. Revenues taken in by the government as a result of allowing civilians to use the airport landing facilities might be converted to better facilities for all. There are other advantages. The point is that the military operates out of some prime locations, the use of which would be extremely attractive to a commercial operator.

The situation is given impetus considering the growing, intense pressure on our nation's airports as traffic grows. "FAA forecasts indicate that Airports will be

expected to handle about 700 million enplanements in 1997, compared to about 400 million in 1985--with virtually the same number of airports." (19:41) The pressure on our national airports is enormous, when "weekly aircraft departures have grown 64% since deregulation. The FAA considers 13 large airports congested today and anticipates that an additional 34 airports will be congested by 2000." (20:89)

Can we take advantage of the situation and mold a more efficient commercial/military airlift system? More importantly, can we use the overcrowded airport situation to help us tailor the U.S. air fleet to include military cargo features? I am convinced this has real potential and that we should begin immediate action to study the possibility with a view to very early implementation. Interest is growing. In January of 1988, the FAA was reported to be studying:

"options that include the takeover of military airports near high-population areas. Such facilities already are operational, capable of handling all-weather aircraft operations and usually have ample room for the construction of commercial passenger terminals. In return, the government would build state-of-the-art military air bases in less populated regions. Also a possibility is opening certain military runways to airline aircraft in the Civil Reserve Air Fleet (CRAF), providing a needed boost for that Defense Dept. program. (21:11)

My proposal would be to negotiate with carriers for use of our military fields when military missions will not be unreasonably hurt, and when the local communities approve

it and will benefit from it. Such a case is Scott Air Force Base, near St Louis. It has access to a rail system, an interstate highway system, a major city, is located near the middle of the country, and has the space to accommodate a freight operation without hurting the military mission. The current "joint-use" plan for Scott Air Force Base calls for a large increase in the size of the base to include at least one more runway. If the plan goes through, cargo carriers will have a central U.S. hub that could be extremely productive. On the other hand, and little advertised, the military will have a greatly expanded facility, which during war can handle much more cargo than the old Scott Air Force Base.

Despite the debate over making Scott AFB a joint-use facility, there has been no mention of its potential impact on the CRAF Enhancement Program. I would submit that it is not too late to let it be known that access to the new facilities will be granted at least to some degree based on the equipment the operator flies and the commitment of that equipment to the CRAF program. If an airline executive operates Boeing 747 cargo aircraft which he has committed to CRAF, he'll receive preferential treatment over an executive who operates less desirable aircraft for the nation's wartime needs or aircraft for which he has not signed a CRAF contract.

Will this be prejudicial to the small carriers?  
Yes, but the small carrier is not in competition with the

long range international. It is in the interest of national airlift to have the long range international carriers fight for the right to operate out of Scott Air Force Base, and we want them to fight by proving their worth to the nation's airlift needs. The small carrier will not be crowded out by this competition. He was not in it in the beginning. He is looking at another, smaller, shorter range, market.

Will selective joint-use be prejudicial to the large passenger carriers? Possibly, yes, although the passenger carriers can also compete by offering aircraft to the CRAF, and should be rewarded significantly for any aircraft they place in the CRAF Enhancement Program. We have also found that there is little interest in passenger airlines in opening new hubs. The new Kansas City airport, for instance, has been used at much less than capacity.

In summary, there is pressure to use military airfields for commercial cargo operations. This proposal has us include in the price of that use a consideration of the carrier's contributions to national airlift.

#### 4. CRAF-Based Landing Fees

This idea came out during a brainstorming session with Col Chuck Jernigan, the "MAC chair" at Air War College in Montgomery, Alabama. Col Jernigan's idea was to adjust landing fees in U.S. airports, based on the military mobility value of the airplane, rather than by gross weight.

Although the subject of landing fees is not one usually studied by Air Force officers, I have discovered what I consider very promising possibilities. In fact, after some months of research, I have found no major barriers to Col Jernigan's suggestion. I have had conversations with officers in the Federal Aviation Administration (FAA), the Department of Transportation DOT), and the American Association of Airport Executives (AAAE). None of these was as negative to the idea as I had expected, and the more research I did, the more feasible the idea became. Here are what I consider to be the pertinent facts:

1. United States airports generally are governed by local airport authorities or "boards." They, and only they, determine landing fees. Currently the U.S. government does not determine the amount of the fee, although it provides strict rules on the method of determining the fee. The basic rule is that fees can be based on direct costs to the airport incurred in the operation of the landing airplane. For instance, an airport can charge more for night landings if it costs more to run the airport at night. It can charge more for noisy airplanes since that is a burden on the community. It can charge more for heavier aircraft, because they create more wear and tear on the facilities. But it may not otherwise discriminate in an attempt to tailor the group of airport users.

The celebrated case of Massachusetts Port Authority (Massport) illustrates the principle. Boston Logan airport began charging landing fees disproportionately larger for small private planes, under a plan called "PACE" (Program for Airport Capacity Efficiency) (22:124). The airport authorities did not hide the fact that the reason was that the airport was becoming too congested and the private airplane sector was no longer welcome. The Department of Transportation ruled on the case clearly in favor of the small private plane. The port authority had violated national policy, especially the Airport and Airways Improvement Act of 1982, by discriminating against small aircraft. (23:4) The decision indicated that they had gone "beyond a fair and reasonable action to effect the legitimate recovery of costs, and clearly cross[ed] over into an area which is inconsistent with Massport's federal grant assurances to keep the airport open and available for public use to all classes of aeronautical users on fair and reasonable terms." (23:9)

Local authority is limited by rules of fairness which are adjudicated by the Department of Transportation. The airports are locally controlled, but by federal rules.

2. Landing fees in the United States are much lower than in most of the rest of the world. An officer of the

American Association of Airport Executives estimated the average landing fee for a jumbo jet in the U.S. to be about \$400. In Japan, Germany, or Great Britain, he estimated it would be nearer \$2000, five times the fee in the United States. (24:1)

3. Other nations sometimes charge more for foreign flights than they charge their own national airline flying the same equipment. The United States has resisted this procedure which it views as clearly in violation of the General Agreements on Tariffs and Trade (GATT).

4. U.S. airports are by law non-profit. They borrow from and contribute to the Aviation Trust Fund, administered by the Federal Aviation Administration. They may use their landing fees to build better facilities, but they may not be profit-making enterprises. They borrow from the Aviation Trust Fund for major improvements.

5. The general industry standard is to charge landing fees based on weight.

6. The Aviation Trust Fund has a very large surplus, estimated at \$6 billion and there is pressure to reduce taxes on passenger tickets and aviation fuel to reduce the surplus. (25:32)

I submit that the above encourages the proposal to charge differentiated landing fees at the nation's airports according to how much each airplane contributes to defense airlift. Since the federal government sets the landing fee rules, it would seem not an impossible task to change the rules to favor airplanes most desirable for wartime airlift.

I propose increasing all landing fees at international airports in the United States to approximately twice what they are now. In 1986, the top 23 U.S. airports had 8,537,800 airplane movements. (32:4) If each movement equates to an average of \$100 in new fees, a potential fund of \$853.78 million is available. Credit would be given for some portion of those fees for each airplane, based on its value to defense airlift, but this represents enough funding for a much more effective CRAF Enhancement program. The goal is not to punish those carriers who do not operate the equipment we want, but to reward those who do. There will be more on this concept in the next chapter.

I recall a meeting I helped set up in 1978. The Commander in Chief of the Military Airlift Command and the Secretary of Defense had a special one-time meeting with the presidents of the major U.S. airlines to talk about how well the civilian airliners were aligned with defense goals. During that meeting, Mr Dick Ferris, then Chief Executive Officer of United Airlines, made a statement directly to the point. I will have to paraphrase: "We at United are about



to make a decision to purchase the Boeing 767 in large numbers. We know that airplane does not meet defense needs. It will take only a little incentive for us to buy an aircraft more suitable to national defense, but we make our decisions in the board room, based on dollars. If you want to influence those decisions, it will require dollars." The government did not find a way to influence United's dollars, and they bought the B-767.

More recently, Federal Express was buying a mix of DC-10-30 aircraft (highly desirable for defense) and Boeing 727s (not as useful for defense). Again, the company recognized its decisions would impact national defense and so they discussed the subject with the Military Airlift Command (MAC). A small investment by the government could have made major changes in their purchases. As it was, MAC was unable to provide incentives. According to the Air Staff, "Despite our interest in the proposal, Public Law 97-86 does not authorize this type of contract. Consequently, Federal Express bought a larger quantity of B-727s and only a few DC-10-30s to meet their demands, none of which had the necessary military utility." (7:8)

The point of the story is that the differentiated landing fees concept is one which would have influenced United's board room and the Federal Express' board room. The companies feel no ill will for us attempting to influence their financial decisions. In fact, these are patriotic Americans who hope we will find a way.

The landing fees concept represents a real possibility, not only because it influences purchases of airplanes, but because it is self supporting. I would recommend splitting the income from landing fees between the airport, the air traffic system, and the CRAF through a new CRAF Enhancement Trust Fund or through new provisions of the Aviation Trust Fund allowing its new money to be used for CRAF modifications and incentives.

#### 5. New MAC Contract Formula

In 1988, the Military Airlift Command granted \$662.8 million in airlift contracts to the commercial airlines. (29:5) The contracts are given to each carrier based on the type and amount of that carrier's contribution to the CRAF. If a carrier represents 15 percent of wartime CRAF movement, then he gets 15 per cent of the military's peacetime airlift business. Some airlines, like Federal Express, do not claim all their proportional business, and "sell" their credits to other airlines. In the case of Fed Ex, Northwest Airlines became their partner for CRAF credits. Also, those airlines which have had aircraft modified under the CRAF Enhancement Program (Fed Ex, United, Pan Am, and Evergreen) are not specifically rewarded in the granting of contracts. Perhaps this should change. There is a general agitation over the current systems. Again, from Mr McHale of Federal Express, in a recent letter to the author:

A revision and refocus is not only necessary, but if done properly, can have a significant impact on MAC/CRAF participation (quantitatively and qualitatively). This is a huge fiscal pool that could be used to institute a win-win situation with DOD and the airline community. This value would be further enhanced and the multiplicity of usage expanded if the current CRAF law were revised to allow the Secretary to enter into more of a "commercial type" contract mode. This MAC award latitude would be a tremendous bargaining chip in fostering the development of the most efficient, cost effective lift. (17:2)

The MAC contract formulas are set and well known among those airlines competing for MAC business. To change the formulas would not only require Congressional action, but could also create havoc in the board rooms where decisions had been made based on an anticipated proportion of the military business. However, my quick analysis is that a recomputation of grants of MAC contracts would not throw out the previous best customers. Those are in fact still the ones which would receive the most business. There would be a new incentive, however, to obtain and fly the airplanes we need for defense, and that is the bottom line goal. In summary, the Departments of Defense and Transportation should form a new study group to examine the apparent efficacy of granting military airlift contracts based on CRAF enhancement goals as well as CRAF participation goals. We have already noted that the express package carriers are not motivated by the current contract rules. One of the goals of the new study is to find ways to move these carriers toward a better fit with military needs.

## SUMMARY

The "options" listed in this chapter turn out to be complementary. Each can be implemented separately or in combination with the others. After evaluating them as a package, we can, however, prioritize them in several different ways. I suggest the chart on the next page as a method to compare the proposals. The attempt was to list the possible advantages and then indicate which advantage applies to each of the four options. Advantages are listed at the side of the chart. The five proposals are listed at the top:

	CRAF-based Landing fee	Joint Use	Restructure Mil Airlift Business	Weight as Bargain Cargo	Current CRAF Enhance
Increases National Cargo Capability	X	X		X?	X?
Increases National Pax Capability	X	X			
Adds to Health of Airline Industry		X	X	X	X
Inexpensive for Taxpayer	X	X?			
Does not require Legislation	X?	X?		X	X
Easy to Administer					
No Interest Group Opposition				X	
Takes Advantage of Current Trends	X	X	X		
Encourage Express Carrier Particip.	X	X	X		

One should not select the option with the largest number of X's, but he should be aware both that the costs vary and that the benefits vary. In my opinion, the landing fees proposal has the greatest promise. Unfortunately, it will be the most difficult to activate. Joint use promises the next greater payoff, but probably is also the next most difficult to activate.

The next chapter explores the advantages and disadvantages of each of the five options outlined above. Each shows potential, and some show great promise. I have taken the opportunity to put them in priority order.

## CHAPTER VI

### THE ANSWER IS THERE, BUT DO WE HAVE THE VISION?

This chapter addresses actions that we should consider, based on evaluations of potential payoffs from the five programs outlined in the last chapter. This paper has two purposes: 1) to clarify the issues, and 2) recommend action. There should be no shying away from either. Following, then, are the recommendations, some of which are relatively simple to implement, and some of which require inter-agency, and perhaps international coordination. In any case it is imperative that we continue the project. Money for mobility is increasingly scarce. The C-17 is the top priority for this money, and we must carefully husband the remainder. The reader should note that the following suggestions all have the benefit of no increases in the funds budgeted for CRAF Enhancement.

#### First Priority: New Landing Fee Policy

The most promising of the options I investigated is the landing fee concept. This idea may not even require legislation, although a Public Law would help combat the objections which would unavoidably occur. The National Airlift Policy is a Presidential document. The Federal

Aviation Administration (an agency of the Department of Transportation) manages the Aviation Trust Fund and the Grants and Assurances which impact airport landing fees. The Department of Transportation establishes aviation policy. The Department of Defense administers the CRAF program. These Executive Branch organizations may be able to work out the procedures without legislation.

Our 1987 National Airlift Policy charges the Department of State and other appropriate agencies to ensure that international agreements and federal policies "protect US national security interests in commercial cargo capabilities." (Appendix 1) Commercial carriers have been incensed for some time over the unfair treatment of flag carriers in the world airlift system. In 1981, officials of nine major airlines sent a letter to the Secretaries of Transportation and State, and the White House Counsel saying ". . . that the discriminatory and anticompetitive practices being followed by some foreign countries and foreign carriers need to be addressed on a priority basis and corrected to the extent feasible." (26:2) They recommended an energetic study group to address CRAF problems. The need is still there, and I submit that the landing fees concept, although not listed in the original letter, would be applauded as a long overdue move to correct imbalances in the costs of airline operation throughout the world. A good

analysis of the proposal with recommended courses of implementation may or may not require legislation.

In any event, the concept would be a simple one. A federal committee, probably located within the Military Airlift Command, will make yearly determinations of which airplanes are most useful for national defense. This will be based on that year's industry makeup and current military capabilities. For the foreseeable future, the long-range, wide-bodied cargo aircraft would receive the most points. Since each airplane is different, the grading would have to be done by individual tail number. A federal landing fee for each aircraft would then be added to the local landing fee for each aircraft. Heavier aircraft should still be expected to pay more, but a heavy cargo airplane would be charged less than a passenger airplane of the same weight and type.

It is important in our analysis to recognize that this proposal will lead to increased revenues for the airports, and they should be allowed to use a portion of the increase to upgrade facilities. The remainder of the money should be placed either in the current Aviation Trust Fund, or more preferably into a new "CRAF Enhancement Trust Fund" to pay for future production or upgrade modifications of passenger airplanes to a cargo (or cargo-convertible) configuration. It would also be used as the incentive to nudge the United or Fed Ex board rooms of the future in the direction dictated by national defense.



This proposal has the huge advantage of producing readiness funds. It also has the advantage of rewarding U.S. carriers who participate in the CRAF program in ways their profit-centered boards of directors understand. There will be criticisms, however, and I would like to quickly address them.

Objection One: Passenger airlines would bear the brunt of the program. This is a true criticism, and almost uniformly, when I bounce the idea off someone in the airline business (even cargo carriers) they advise that the airline lobby will kill the idea. Also, the traveling public will not be an advocate since the cost of a ticket would go up. Cost effectiveness of each route segment would have to be recalculated. Plus, it would gall the passenger hauler to see that the cargo hauler is paying less for the same type and weight plane.

These arguments, though valid, do not outweigh the advantages. If landing fees were increased by \$500 dollars per jumbo, that is in the \$2 per passenger range. I submit that is too small an increase in ticket price to be considered significant by the average traveler. Besides, the passenger operator can lower the landing fees for his planes by signing CRAF contracts for them, or by allowing them to be modified in the CRAF Enhancement Program.

Objection Two: The Proposal Discriminates against Foreign Carriers. Bilateral treaties negotiated by the State Department for aviation have been notoriously one-sided in favor of the foreign carrier. This was initially necessary because of post World War II fears that Americans would monopolize international air travel. (1:67) Now, when U.S. carriers fly overseas, they pay at least two times the U.S. landing fees on the average and their access to through-flight destinations (fifth freedom rights) are very much restricted. Some nations blatantly violate international trade conventions by granting lower fees for operations of their own flag carriers. This long-time bargain for foreign carriers operating in the U.S. must now be adjusted. The foreign carriers are growing faster than their American counterparts. "The loss of U.S. market share has been a concern of U.S. airlines for several years. The international passenger market share of U.S. flag airlines has shifted from a high of 50.7% in 1983 to a low of 47.1% in 1986" (27:87) Furthermore, our own airplanes which have been committed to the CRAF should logically be given a "readiness subsidy" when operating out of our own airfields.

It would also be possible to give a landing-fee break to those foreign-owned aircraft committed to the "NATO Allied Pre-committed Civil Aircraft Program

(NAPCAP)," which is the NATO equivalent to CRAF. A similar break could be given those Korean aircraft committed to the civil air augmentation program for the reinforcement of Korea. This would soften foreign objections somewhat. It is beyond the scope of this paper to make recommendations on actual fees, but the Department of Transportation-Department of Defense study group will have to carefully evaluate the landing fee structure.

When put in the perspective of potential benefits, the advantages outweigh the objections. Given this program's potential advantages, it should be the first action implemented.

#### SECOND PRIORITY--JOINT USE

The second priority for implementation is joint-use of military airfields. This is also a low-cost or no-cost option for the government. Cargo carriers should be solicited for bids to build facilities at existing military airfields and for the right to operate cargo service from those fields. If Flying Tigers wants to operate out of McChord Air Force Base, Washington, they will bid for the right. Acceptance of the bid will be based not only on benefit to the base and the surrounding communities, but on the types of aircraft the company will operate, based on the "benefit to national defense" rule of the landing fees

discussion above. Although the initial joint-use concept applies to cargo carriers only, it is plausible that selected bases in the future could afford to give space for passenger terminals. Contracts would be granted to the passenger carriers just like the cargo carriers--based on that company's contributions to national defense through participation in CRAF and operation of defense-valuable airplanes.

There is a real pressure on our limited number of commercial airports in the United States. The last major new airport was Dallas/Ft Worth in 1974. (28:87) Last Spring, a powerful industry coalition was formed to address the problems of limited airport capacity in this country. Members include 16 airlines, aircraft manufacturers, and engine manufacturers. "The group has obligated \$3 million to start its program and estimates it may spend \$15 million over the next two years." (28:87) People are serious about the lack of capacity, and the pressure of their concern adds a sense of urgency to the proposal to open military fields to civilian operations.

Problems with the joint-use concept begin with the need for lengthy negotiations with surrounding communities, to include environmental impact studies. Another problem is administration of the program, especially establishing procedures to transfer funds to the federal coffers. I would suggest using the new "CRAF Enhancement Trust Fund" generated by the landing fee suggestion above. If not, the expanded Aviation Trust Fund could be effective if carefully

managed. The money must be used for an invigorated CRAF Enhancement Program. A third problem and one requiring careful study is the breach in base security represented by a civilian operation on an Air Force Base. This is especially important in an era of increasing terrorist threat, and may make some military fields unacceptable for joint-use.

The range of commercial activity at the various military airfields would probably be great. At one field, a cargo carrier may just need a small building to take packages from and offload them into, without refueling the aircraft which brought them in. At another, a full fledged cargo processing warehouse may be proposed. In any event, the nation gains both by having the new facilities at a military base (to be used for military cargoes if required in a national emergency) and by the leverage it gives us to motivate carriers to operate the equipment we want.

### THIRD--SELLING MILITARY AIRLIFT BUSINESS

The third priority activity is recomputing how MAC portions out its cargo business. I make this recommendation with some trepidation. The old formulas have kept a healthy CRAF system in being for many years. The formulas, however, are based only on how much tonnage the carrier has committed to the program. It may be time to put into the formula a reward for a company's operating the kind of equipment most

beneficial for airlift. It is imperative for us to also figure out a way to better include the package carriers. It is at least worthy of a study group.

#### FOURTH PRIORITY--WEIGHT AS CARGO

The fourth priority activity is weight as bargain cargo. We have seen that it would be foolish for the military to pay for the extra weight created by modification for cargo conversion at the same rate as commercial cargo. We have not thrown out the idea, however, of paying some fee for that weight at a rate below commercial cargo. The concept should be considered by the next proposal for a passenger conversion.

#### FIFTH--CURRENT CRAF ENHANCEMENT SYSTEM

The Fifth priority is to keep the current CRAF Enhancement system intact. One is tempted by the current boom in the airline business to rule out the possibility of increased activity in CRAF Enhancement. The airlines are buying more capacity and are not anxious to lose an aircraft for a period of modification, nor are they anxious to fly the heavier airplane after it is modified. The air-travel boom will not last forever. Also, in boom years Public Law 97-86 has attracted new CRAF Enhancement participants under the "fifty per cent rule." The system should be kept ready and actively pursued in the case that excess capacity devel-

ops in the long-range aircraft sector. It must also be kept going because both the landing fee and the joint-use proposals should help create new interest in CRAF Enhancement.

### SUMMARY

This chapter has prioritized the five suggestions for an imaginative and energetic new program designed to tailor the commercial national air fleet for wartime needs. All five suggestions are achievable. The only question is one of will. There are exciting possibilities presented in the five concepts above, and I hope we do not lack the vision to implement them.

## CHAPTER VII

### VISION

The most common failures of defense-enhancement ideas are because of cost tradeoffs. There are too many good ideas competing for increasingly limited funding. The programs recommended in this paper have the unusual advantage of being self-sufficient. This suggests that they can be and should be pursued immediately.

They do require an unsettling of the current CRAF contract and CRAF Enhancement bureaucracies. I do not underestimate the difficulties of this task, but I must underscore the potential payoffs if we get to work with a vision of a much expanded Civil Reserve Air Fleet. A 1987 study by the transportation consulting firm Harbridge House predicted that over 1000 new wide-bodied aircraft will be placed in the inventory by 2004. Even though many of those have been ordered without regard to defense needs, the remainder represent a unprecedented opportunity to manage the civil airline fleet. (12:56)

### UNDERLYING TRUTHS

Before leaving the discussion, I would request the reader's indulgence while I restate the logic underlying the paper's five proposals:



1. Government direction and military business have created the strong airline business as it exists today. It has been a successful partnership, and both parties should recognize the symbiotic nature of the relationship. Both airline and government should search for new ways to take advantage of potentials for continued cooperation.

2. We cannot meet the transportation needs of modern war plans with military transportation alone.

3. To maximize wartime airlift we must take advantage of airline potentials--including a potential for converting excess passenger capability to cargo capability, and for encouraging the existence of the kinds of cargo airplanes most helpful to our wartime airlift challenges.

4. The five concepts outlined in this paper will help mold the airline industry, to its own benefit and to the benefit of national defense.

In this paper I have outlined actions required to take advantage of these four factors. The paper presents a plan, one which promises large payoffs. It does not require excessive funding, but it does require vision--and it does require action.

## **THE WHITE HOUSE**

### **WASHINGTON**

June 24, 1987

#### **NATIONAL SECURITY DECISION DIRECTIVE NUMBER 280**

#### **NATIONAL AIRLIFT POLICY**

The United States' national airlift capability is provided from military and commercial air carrier resources. The national defense airlift objective is to ensure that military and civil airlift resources will be able to meet defense mobilization and deployment requirements in support of US defense and foreign policies. Military and commercial resources are equally important and interdependent in the fulfillment of this national objective.

Our basic national security strategy recognizes the importance of strategic lift, and the need to reduce current shortfalls. The broad purpose of this directive is to provide a framework for implementing actions in both the private and public sectors that will enable the US efficiently and effectively to meet established requirements for airlift in both peacetime and in the event of crisis or war. Toward this end, the following policy guidelines are established:

1. United States policies shall be designed to strengthen and improve the organic airlift capability of the Department of Defense and, where appropriate, enhance the mobilization base of the U.S. commercial air carrier industry. A U.S. commercial air carrier is an air carrier holding a certificate issued pursuant to section 401 of the Federal Aviation Act of 1958, as amended.
2. The goal of the United States Government is to maintain in peacetime organic military airlift resources, manned, equipped, trained and operated to ensure the capability to meet approved requirements for military airlift in wartime, contingencies, and emergencies. Minimum utilization rates shall be established within the Department of Defense which will provide for levels of operation and training sufficient to realize this goal.
3. The Department of Defense shall determine which airlift requirements must move in military airlift manned and operated by military crews because of special military considerations, security, or because of limiting physical characteristics such as size, density, or dangerous properties; and which airlift requirements can be appropriately fulfilled by commercial air carriers.

4. The commercial air carrier industry will be relied upon to provide the airlift capability required beyond that available in the organic military airlift fleet. It is therefore the policy of the United States to recognize the interdependence of military and civilian airlift capabilities in meeting wartime airlift requirements, and to protect those national security interests contained within the commercial air carrier industry.
5. During peacetime, Department of Defense requirements for passenger and/or cargo airlift augmentation shall be satisfied by the procurement of airlift from commercial air carriers participating in the Civil Reserve Air Fleet program, to the extent that the Department of Defense determines that such airlift is suitable and responsive to the military requirement. Consistent with the requirement to maintain the proficiency and operational readiness of organic military airlift, the peacetime cargo airlift augmentation in order to promote the effectiveness of the Civil Reserve Air Fleet and provide training within the military airlift system.
6. Short-term airlift capability required to meet contingency requirements which might be considered minor surges shall be provided by increased utilization of aircraft in the organic sector, as well as by the increased utilization of the commercial air carriers regularly providing service to the Department of Defense.
7. United States Government policies should provide a framework for dialogue and cooperation with our national aviation industry. It is of particular importance that the aviation industry be apprised by the Department of Defense of long-term requirements for airlift in support of national defense. The Department of Defense and the Department of Transportation shall jointly develop policies and programs to increase participation in the Civil Reserve Air Fleet and promote the incorporation of national defense features in commercial aircraft. Government policies should also support research programs which promote the development of technologically advanced transport aircraft and related equipment.
8. The Department of State and other appropriate agencies shall ensure that international agreements and federal policies and regulations governing foreign air carriers foster fair competition, safeguard important US economic rights, and protect US national security interests in commercial cargo capabilities. Such agencies should also promote among US friends and allies and other transportation capabilities, and work to obtain further commitments from such countries and foreign air carriers in support of our mutual security interests.

9. United States aviation policy, both international and domestic, shall be designed to strengthen the nation's airlift capability and where appropriate promote the global position of the United States aviation industry.

The Department of State, the Department of Defense, the Department of Commerce, the Department of Transportation, the Federal Emergency Management Agency, and the National Aeronautics and Space Administration shall provide leadership within the executive branch in implementing these objectives.

This directive replaces the Presidentially approved Courses of Action contained in the February 1969 Department of Defense study, The Role of Military Air Transport Service in Peace and War.

/S/ Ronald Reagan



DEPARTMENT OF THE AIR FORCE  
WASHINGTON, D.C. 20330-1000

OFFICE OF THE SECRETARY

19 Feb 89

The Honorable Robert C. Byrd  
Chairman,  
Committee on Appropriations  
United States Senate  
Washington, D.C. 20510-6025

Dear Mr. Chairman:

The Senate Appropriations Committee Report on the FY 1989 Department of Defense (DOD) Appropriation Bill requested that the Air Force submit a report detailing the estimated cost and benefits of expanding the scope of the Civil Reserve Air Fleet (CRAF) Enhancement Program. The attached report fulfills the Congressional request for information and proposes such an expanded CRAF Enhancement Program.

The CRAF has been providing ready, cost effective airlift to the DOD since 1952 and plays a major role in national defense. The ongoing CRAF Enhancement Program was designed to increase the long-range cargo capability of the CRAF but lacks the flexibility to improve the military utility of many new and existing commercial aircraft.

We believe the DOD should be authorized to incorporate cargo-capable features into new and existing civilian aircraft that would enhance their military utility in a national emergency. This participation would also include incorporating into select cargo and passenger aircraft: secure communications equipment, military cargo handling features, and equipment which would enable the Air Traffic Control system to readily identify commercial aircraft in a hostile environment.

Expanding the scope of the CRAF Enhancement Program would enable the DOD to improve the military utility of the CRAF in a very effective and efficient manner.

Sincerely,

/s/

1 Attachment  
Requested Report

Report to the Congress

on

Expanding the Scope of the

Civil Reserve Air Fleet Enhancement Program

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**Report to the Congress**  
  
**on**  
  
**Expanding the Scope of the**  
  
**Civil Reserve Air Fleet Enhancement Program**

**INTRODUCTION**

The Senate Appropriations Committee Report on the FY 1989 Department of Defense (DOD) Appropriation Bill requested that the Air Force submit a report detailing the estimated cost and benefits of expanding the scope of the Civil Reserve Air Fleet (CRAF) Enhancement Program. This report answers the Congressional request for information and proposes such an expanded CRAF Enhancement Program.

Expanding the scope of the CRAF Enhancement Program is consistent with the June 1987 National Airlift Policy statement which directed the Department of Defense (DOD) and the Department of Transportation (DOT) to "promote the incorporation of defense features in commercial aircraft." The objective of the National Airlift Policy is to ensure military and civil airlift resources will be able to meet defense mobilization and deployment requirements in support of US defense and foreign policies. Expanding the CRAF Enhancement Program would permit the DOD to participate in building new civilian aircraft or in modifying existing civilian aircraft in any of the cargo-capable



configurations: all-cargo freighters, cargo convertible passenger aircraft, or combination passenger/cargo aircraft (combi). It would also permit DOD to participate in incorporating necessary communications and navigational equipment to make civil passenger aircraft interoperable with the military airlift system. The elements of this expanded program would include incorporating into select cargo and passenger aircraft: secure communications equipment, aircraft range enhancements, military cargo handling features, and equipment which would enable the Air Traffic Control system to readily identify commercial aircraft as friend or foe (IFF units). Expanding the scope of the CRAF Enhancement Program will require modifications to the authorizing legislation for this program (Public Law 97-86).

#### BACKGROUND

The Civil Reserve Air Fleet (CRAF) has been providing ready, airlift augmentation to the DOD since 1952. Its basis is a series of interagency agreements and contracts with civil carriers giving the DOD access to a civilian fleet of aircraft to assist in meeting wartime requirements. The CRAF currently consists of 441 civil aircraft. The long-range, international portion consists of 99 cargo aircraft, capable of carrying over 13 million ton-miles of cargo per day, and 276 passenger aircraft, capable of carrying nearly 158 million passenger-miles per day. This is nearly 24 percent of the cargo airlift and 95 percent of the passenger airlift available to the DOD for

movement from the United States to overseas in the event of a national emergency. To replace this capability, the DOD would have to purchase 86 Boeing 747-100 all cargo aircraft and 205 Boeing 747 passenger aircraft. One of the factors making CRAF attractive to the DOD is the fact that many of the aircraft that meet the demands of the commercial market place can provide passenger and cargo airlift to the DOD in time of national emergency without time-consuming modification.

In return for providing this airlift augmentation for the DOD, the civil airlift industry earns peacetime revenue through contracted movement of a portion of DOD cargo and passenger airlift. Each carrier's share of this peacetime business is based on the type and amount of airlift capability it commits to the CRAF.

This airlift capability plays a major role in national defense. A fundamental principle of our national strategy calls for the rapid projection of US forces to protect our national interests and to honor commitments to our allies. The 1981 Congressionally Mandated Mobility Study (CMMS) looked at our nation's ability to project those forces under four representative scenarios. It concluded the DOD was short of airlift and recommended a program be adopted that would increase DOD's airlift capability to 66 million ton miles per day (MTM/D). Ton miles are used as a measure of airlift requirements or capability. A ton mile of requirement is what it would take to

move a ton of cargo one nautical mile. A specific requirement would be to move a 105-MM Howitzer weighing 7 tons from Ft Campbell, Kentucky, to central Europe (4300 NM). This would equate to 30,100 ton miles or 0.030 MTM.

The Air Force Airlift Master Plan details our efforts to achieve the 66 MTM/D goal with a mixture of military and CRAF aircraft. One program to reduce the shortfall will be the acquisition of the C-17 airlifter. However, military and commercial resources and equally important and interdependent in meeting defense mobilization requirements. The 1987 National Airlift Policy recognized the importance of commercial airlift when it stated that "the commercial air carrier industry will be relied upon to provide the airlift capability required beyond that available in the organic military airlift fleet." The National Airlift Policy also directs the DOD to "promote the incorporation of defense features in commercial aircraft."

One of the most cost effective elements of the Air Force Airlift Master Plan is the ongoing CRAF Enhancement program, authorized by Public Law 97-86, designed to add even more cargo capability to the CRAF. This program allows the Secretary of the Air Force to contract for the addition of certain features to civil passenger aircraft in order to make them useful as cargo aircraft. These features increase an aircraft's ability to carry the bulky and oversize cargo needed in war by installation of a cargo floor (substantially stronger than the conventional floor),

a cargo door, and a roller and rail system to accommodate standard military cargo configurations. The program objective is an FAA certificated "cargo-convertible" aircraft.

Under the current CRAF Enhancement Program, the DOD pays for the additional costs associated with building a new passenger aircraft as a cargo-convertible or the cost of modifying an existing passenger aircraft. However, a convertible aircraft weighs more than a passenger aircraft because it has a stronger floor and cargo door. Therefore, it will cost the owners more to operate a convertible aircraft on a day-to-day basis. If the participating air carrier has no need for the added cargo capability and agrees not to use it in peacetime, the DOD compensates the air carrier for all the additional costs associated with operating a heavier aircraft. If the carrier uses the main deck capability of the aircraft to move cargo in peacetime, the DOD pays for up to 50 percent of the additional construction or modification costs and nothing more. Participants in the program must commit the aircraft to the CRAF for 12 to 16 years and provide appropriate refunds to the government if an aircraft concerned is sold or destroyed during the contract period.

A great advantage of this program is that it increases the amount of airlift available while it avoids the acquisition, training, and support costs associated with purchasing and operating an additional DOD-owned fleet of cargo aircraft.

Though CRAF cargo-convertible aircraft lack the loading versatility and operational flexibility of military aircraft such as the C-17, they do contribute to the nation's wartime airlift capability.

The existing CRAF Enhancement Program is beneficial and will increase the long-range, international cargo capability of the CRAF by just over 3.3 million ton-miles per day by 1990. Thus far, the government has contracted with four airlines for a total of 23 aircraft. The first contract was for \$17.9 million with United Airlines for a new DC-10-10 delivered in September 1982. The second was for the retrofit of 19 existing Pan American World Airways Boeing 747 aircraft at a cost to the government of approximately \$30 million each. The last of these aircraft will be delivered in Oct 1989. The third contract, for \$4.3 million, was awarded in 1986 to Federal Express for a DC-10-30 cargo convertible aircraft delivered in September 1987. The most recent CRAF enhancement contract was awarded to Evergreen Airlines to modify two existing Boeing 747 passenger aircraft. The modification of these aircraft should be completed by November 1989 at a government cost of \$4.6 million each. The cost of the Federal Express and Evergreen contracts is significantly lower than the United and Pan American contracts because Federal Express and Evergreen use the additional cargo capability in peacetime. A summary of these contracts is shown below.

Aircraft Type	Capability (Tons)	Term (Yrs)	Contract Cost
United DC-10-10	40.5	16	\$17.9M
Pan Am B-747	73.1	12	\$30.0M
Fed Ex DC-10-30	54.6	16	\$ 4.3M
Evergreen B-747	73.1	12	\$ 4.6M

#### DEFICIENCIES IN THE CURRENT CRAF ENHANCEMENT PROGRAM

Despite the success of the current CRAF Enhancement Program, it is deficient in that it does not allow the DOD to participate in building new civilian aircraft or in modifying existing civilian aircraft in all of the cargo-capable configurations: all-cargo freighters, cargo convertible passenger aircraft, or combination passenger/cargo aircraft (combi). Additionally, it does not provide for DOD participation in the incorporation of necessary communications and navigational equipment to make civil passenger aircraft interoperable with the military airlift system.

Our primary concern is with the growing number of "missed opportunities" to improve the military utility of new acquisitions. Civilian carriers are buying a new generation of commercial all-cargo aircraft, but they lack the necessary range, avionics, and/or cargo handling features needed for DOD use. For example, in 1987, United Parcel Service (UPS) began purchasing 20 B-757 Package Freighters. Unfortunately, these aircraft lack both a compatible military cargo handling system and the

equipment for long-range overwater operations, required for CRAF participation. Because Public Law 97-86 does not allow the DOD to contract for such features in all-cargo aircraft, these 20 UPS B-757s will not be useful to the CRAF and, therefore, will not be enrolled in the program.

Similarly, Federal Express was planning to buy a large quantity of medium-range, narrow-body cargo aircraft (B-727s) and only a few long-range, wide-body aircraft (DC-10-30s) to meet their growing business requirements. However, in recognition of the Air Force's long-range cargo shortfall, Federal Express was prepared to buy a larger quantity of DC-10-30s, provided the government would pay a portion of the cost differential between the DC-10-30s and the B-727s. For this cost differential, the DOD would have received into CRAF some very militarily useful aircraft that were equipped with the necessary material handling systems and communications. Despite our interest in the proposal, Public Law 97-86 does not authorize this type of contract. Consequently, Federal Express bought a larger quantity of B-727s and only a few DC-10-30s to meet their demands, none of which had the necessary military utility.

Another deficiency in the existing program is the inability to incorporate equipment or design features which would ensure the military interoperability of civil passenger aircraft which will move 95 percent of the airlifted troops in the event of an emergency. Currently the DOD radars may not be able to

distinguish between civil passenger aircraft and foreign military threat aircraft operating in a hostile environment.

Because of these deficiencies in the existing CRAF Enhancement Program, we recommend that its scope be expanded. However, to expand the CRAF Enhancement Program, new legislation will be required.

#### PROGRAM DEFINITION

First, an expanded CRAF Enhancement Program should enable the DOD to be involved in the development and procurement of add-on equipment to enhance the compatibility of not only cargo convertible passenger aircraft, but also all-cargo freighters, combination passenger/cargo aircraft, and civil passenger aircraft. Such equipment would include secure communications, aircraft range enhancements, and Identification, Friend or Foe (IFF) units. The ability to pass important mission control information in a timely and secure manner, and to identify these aircraft as friendly vehicles operating in support of a major reinforcement, will ensure the utility of these aircraft during a crisis. Because this equipment is not needed on a daily basis by the airlines, it would be designed as light-weight, carry-on equipment which would remain the property of the government. The equipment would also be removed from the aircraft should it be sold to a foreign carrier or retired. Such equipment would be designed in close cooperation with the airlines, with



installation, maintenance, and training provided and paid for by the DOD.

Second, the DOD needs the flexibility to be able to work toward the modification of civil aircraft to incorporate cargo-convertible or cargo-capable features to increase the long-range cargo capability of the CRAF. This would be done by DOD participation in the building of new aircraft, or the modification of existing aircraft to any of the cargo-capable configurations-freighter, convertible, or combi<sup>1</sup>.

The new program should also be general enough to allow the DOD to contract with the air carriers for incorporation of additional defense features as necessary.

#### SCOPE AND FUNDING

It should not be the goal of the new program to modify every new or existing long-range aircraft in the US civil inventory. Incorporating defense features such as secure communications, appropriate navigational equipment, IFF, and cargo features into all long-range aircraft would be unrealistic since there will always be some essential civil requirements which would preclude a 100 percent allocation to the DOD by DOT. However, there are a large number of aircraft that should be equipped with the necessary features to support the nation's defense needs. For example, all 375 long-range aircraft participating in the CRAF should have secure communications and militarily compatible IFF systems. In addition to the communications and navigation

requirements, we must have a way to encourage the incorporation of standard military cargo handling capability into newly acquired civilian aircraft to allow their enrollment into the CRAF. This new authority would allow us to provide an incentive (cost of modification) to the carrier to place additional aircraft in the CRAF.

Some elements of this program would have to wait for full implementation. For example, the installation of communications and navigation equipment should be delayed until standard specifications have been finalized, to include interoperability with NATO. However, other elements should be acted on now. Specifically, we should equip the 20 United Parcel Service B-757 Package Freighters with cargo handling equipment (MHE) compatible with our system. This will cost approximately \$90,000 per aircraft. To initiate this portion of the program we are requesting \$0.9 million in the FY90 aircraft modification budget. To complete the program, we will require \$0.9 million in FY91. We should also seek an FAA waiver for the B-757s to operate overwater during CRAF Stage III activation.

It is impossible to estimate the precise cost of DOD compatible communications until the specifications are finalized. However, we estimate that \$2 million per year would allow us to modify up to 40 aircraft per year. Additional funds would be required to incorporate needed range enhancements.

Since commercial operators do not need to purchase these features for their own operations, the DOD should program to install necessary fixtures and wiring in the aircraft during production. This installation would enable the DOD to add lightweight, carry-on electronic equipment at a later date. Otherwise, we can expect future aircraft to be purchased without these required defense features. A proportionally small government investment would increase the capability of the CRAF in a very cost-effective manner. The table below illustrates the costs to incorporate modifications into two types of aircraft.

Aircraft	Secure Communications	IFF System	MHE
B-757	\$25,000	Unknown	\$90,000
B-767	\$25,000	Unknown	N/A

Modifications to additional aircraft are difficult to program and have historically been "targets of opportunity." This makes long term planning difficult at best. However, for the past several years we have had the opportunity to enhance two to three aircraft per year at an average cost of \$5 million each. As funds are programmed, a level of effort of two aircraft per year should be pursued. In the interim, as targets of opportunity present themselves, reprogramming actions could be taken.

### COST AND BENEFITS

In preparation of this report, we compared the costs and benefits of the proposed expansion of the CRAF Enhancement Program with the current CRAF Enhancement Program and the option of government ownership.

While the current program is cost-effective, its limitations often cost the DOD more than necessary. One example is the recent contract to modify an Evergreen B-747 passenger aircraft to a cargo-convertible aircraft. This contract cost \$4.6 million, and the aircraft will be committed to the CRAF for 12 years, fully supported by four crews. Conversely, it would cost the government approximately \$81 million to acquire the aircraft and operate it for the same length of time. However, if this aircraft could have been converted to a cargo-only aircraft, rather than being required to retain its passenger capability, we would have been able to save even more. Under the existing legislation, Evergreen must maintain the capability to carry passengers. This includes maintenance and storage of seats, emergency oxygen systems, additional lighting, public address systems, and the ability to reinstall all of these passenger-only features. However, neither the DOD nor the carrier has any intention of ever using this aircraft in the passenger configuration.

Under the current CRAF Enhancement Program, aircraft are committed to the DOD for a period of 12 to 16 years. However,

given the current state of aircraft manufacturing technology, it is not unrealistic to require a longer commitment for new aircraft which participate in the program. In recognition of the longer commitment and enhanced capability, an investment of \$5.0 to \$10.0 million would be appropriate for a new Boeing 747, McDonnell Douglas DC-10-30, or MD-11 aircraft committed for 17 to 21 years. The table below shows the capability and projected government ownership cost for three types of new aircraft.

Aircraft Type	Capability (Tons)	Term* (Yrs)	CRAF** Investment	Government*** Ownership
DC-10-30	73	20	\$5-10M	\$ 92M
MD-11	80	21	\$5-10M	\$117M
B-747-200	91	17	\$5-10M	\$103M

\* This is based on projected service life of aircraft.

\*\* Actual investment would depend on the type of aircraft, the term of the contract, and the amount of capability purchased relative to the carriers' peacetime needs.

\*\*\* This is the approximate cost of owning and operating these aircraft for the projected service life.

These examples show that the benefits of CRAF enhanced aircraft relative to the government ownership option are significant. As mentioned earlier, the reason is that the majority of the acquisition, operating, and maintenance costs are paid by the carriers. The government only pays the marginal costs associated with incorporating the necessary military capability and, if necessary, with operating a heavier commercial aircraft.

## LEGISLATION

Legislation is needed to optimize the potential benefits from the Civil Reserve Air Fleet. This new legislation should give the Secretary of the Air Force the authority to participate in building new civilian aircraft or in modifying existing civilian aircraft in any of the cargo-capable configurations: all-cargo freighters, cargo convertible passenger aircraft, or combination passenger/cargo aircraft (combi). It should also permit DOD to participate in incorporating necessary communications and navigational equipment to make civil passenger aircraft interoperable with the military airlift system. The legislation should be flexible and should be tailored to support the acquisition of civil aircraft which best meet defense needs.

Such legislation authorizing an expanded CRAF Enhancement Program would keep the nation strong by promoting the growth of airlift capability and by controlling the government spending needed to accomplish this effort. The US commercial air cargo and passenger industry is growing, and the program can take advantage of this opportunity to ensure that the defense airlift capability of the CRAF also continues to grow.

## SUMMARY

The Civil Reserve Air Fleet has been providing ready, cost-effective airlift to the DOD since 1952. The ongoing CRAF Enhancement Program was designed to add even more cargo capability to the CRAF but lacks significant features to better meet projected airlift needs. CRAF Enhancement remains the most cost-effective way to obtain the required airlift capability while maintaining a balanced force structure. However, legislation is needed to expand the CRAF Enhancement Program. This new legislation should permit the DOD to participate in building new civilian aircraft or in modifying existing civilian aircraft in any of the cargo-capable configurations: all-cargo freighters, cargo convertible passenger aircraft, or combination passenger/cargo aircraft (combi). It should also permit DOD to participate in incorporating necessary communications and navigational equipment to make civil passenger aircraft interoperable with the military airlift system.

# PROPOSAL

## A BILL

To amend the statutes relating to the Civil Reserve Air Fleet.

Be it enacted by the Senate and House of Representatives of the United States of America, in Congress assembled, that Sec. 1. Subchapter II of chapter 931 of title 10, United States Code, is amended to read as follows:

" 9511. Definitions

"In this subchapter:

"(a) The terms "Aircraft", "citizen of the United States", "person", and "public aircraft" have the meaning given those terms by section 101 of the Federal Aviation Act of 1958 (49 U.S.C. 1301).

"(b) The term "cargo air service" means the carriage of property or mail on the main deck of a civil aircraft.

"(c) The term "cargo-capable aircraft" means a civil aircraft equipped so that all or substantially all of the aircraft's capacity can be used for the carriage of property or mail.

"(d) The term "passenger aircraft" means a civil aircraft equipped so that its main deck can be used for the carriage of individuals and cannot be used principally, without major modification, for the carriage of property or mail.

"(e) The term "cargo-convertible aircraft" means equipment or design features included or incorporated in a passenger aircraft that can readily enable all or substantially all of that aircraft's main deck to be used for the carriage of property or mail.

"(f) The term "civil aircraft" means an aircraft other than a public aircraft.

"(g) The term "combi aircraft" means a civil aircraft equipped so that it can simultaneously carry individuals and property or mail on the main cargo deck.

"(h) The term "Civil Reserve Air Fleet" means those aircraft allocated, or identified for allocation, to the Department of Defense under section 101 of the Defense Production Act of 1950 (50 U.S.C. App. 2071), or made available (or agreed to be made available) for use by the Department of Defense under a contract made under this title, as part of the program developed by the Department of Defense through which the Department of Defense augments its airlift capability by use of civil aircraft.



"(i) The term "contractor" means a citizen of the United States (A) who owns or controls, or who will own or control, a civil aircraft and who contracts with the Secretary of the Air Force to modify that aircraft by including or incorporating defense features in a new or existing aircraft and to commit that aircraft to the Civil Reserve Air Fleet, or (B) who subsequently obtains ownership or control of a civil aircraft covered by such a contract and assumes all existing obligations under that contract.

"(j) The term "existing aircraft" means a civil aircraft other than a new aircraft.

"(k) The term "new aircraft" means a civil aircraft that a manufacturer has not begun to assemble before the aircraft is covered by a contract under section 9512 of this title.

"(l) The term "Secretary" means the Secretary of the Air Force.

"(m) The term "defense features" means equipment or design features included or incorporated in civil aircraft which ensure the interoperability of these aircraft with the Department of Defense airlift system; they also include the modification of civil aircraft to incorporate cargo-convertible, cargo-capable, or combi features.

" 9512. Contract for the inclusion or incorporation of defense features

"(a) Subject to chapter 137 of this title, and to the extent that funds are otherwise available for obligation, the Secretary may contract with any citizen of the United States for any new or existing aircraft to be owned or controlled by that citizen for the inclusion or incorporation of defense features. Pursuant to this same authority and the availability of funds, the Secretary may contract with a person chosen by the contractor to include or incorporate defense features in new aircraft scheduled to be used by a U.S. air carrier.

"(b) Each contract made shall include the terms required by section 9513 of this title. The contractor shall agree to repay to the United States all or a percentage (to be established in the contract) of any amount paid by the United States to the contractor under the contract with respect to any aircraft if--

"(1) the aircraft is destroyed or becomes unusable, as defined in the contract;

"(2) the defense features specified in the contract are rendered unusable or removed from the aircraft;

"(3) control over the aircraft is transferred to any person that is unable or unwilling to assume the contractor's obligation under the contract;

"(4) the registration of the aircraft under section 501 of the Federal Aviation Act of 1958 is terminated for any reason not beyond the control of the contractor.

"(c) The Secretary may under the contract be authorized to contract directly with a person chosen by the contractor to include or incorporate defense features in that aircraft, and to pay to that person chosen by the contractor.

" 9513. Commitment of aircraft to the Civil Reserve Air Fleet

"(a) Each contract under section 9512 of this title shall provide--

"(1) that any aircraft covered by the contract shall be committed to the Civil Reserve Air Fleet;

"(2) that, so long as the aircraft is owned or controlled by a contractor, the contractor shall operate the aircraft for the Department of Defense as needed during any activation of the full Civil Reserve Air Fleet, notwithstanding any other contract or commitment of that contractor; and

"(3) that the contractor operating the aircraft for the Department of Defense shall be paid for that operation at fair and reasonable rates.

"(b) Notwithstanding section 101 of the Defense Production Act of 1950 (50 U.S.C. App. 2071), each aircraft covered by a contract under section 9512 of this title shall be committed exclusively to the Civil Reserve Air Fleet for use by the Department of Defense as needed during any activation of the full Civil Reserve Air Fleet unless the aircraft is released from that use by the Secretary of Defense.

Sec. 1. The table of sections at the beginning of such subchapter is amended to read as follows:

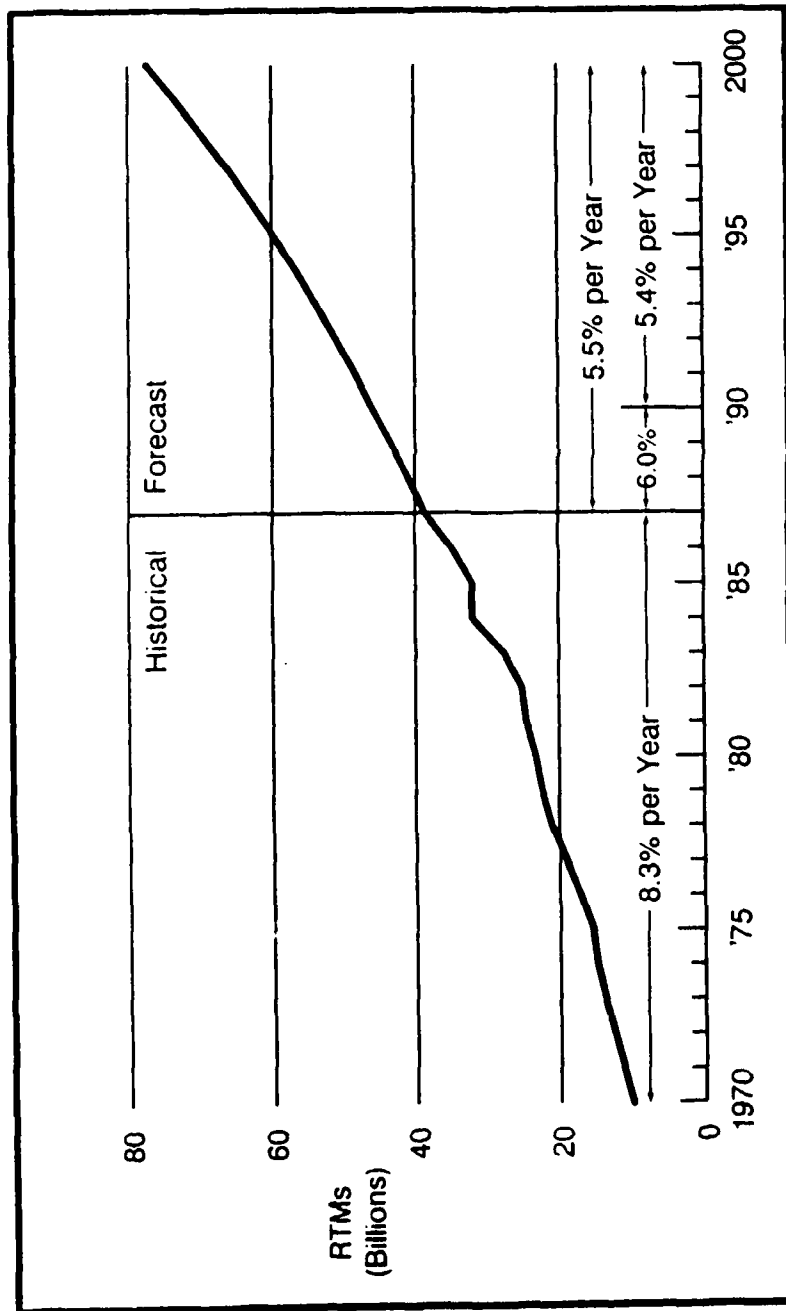
"Sec.

"9511. Definitions.

"9512. Contract for the inclusion or incorporation of defense features.

"9513. Commitment of aircraft to the Civil Reserve Air Fleet."

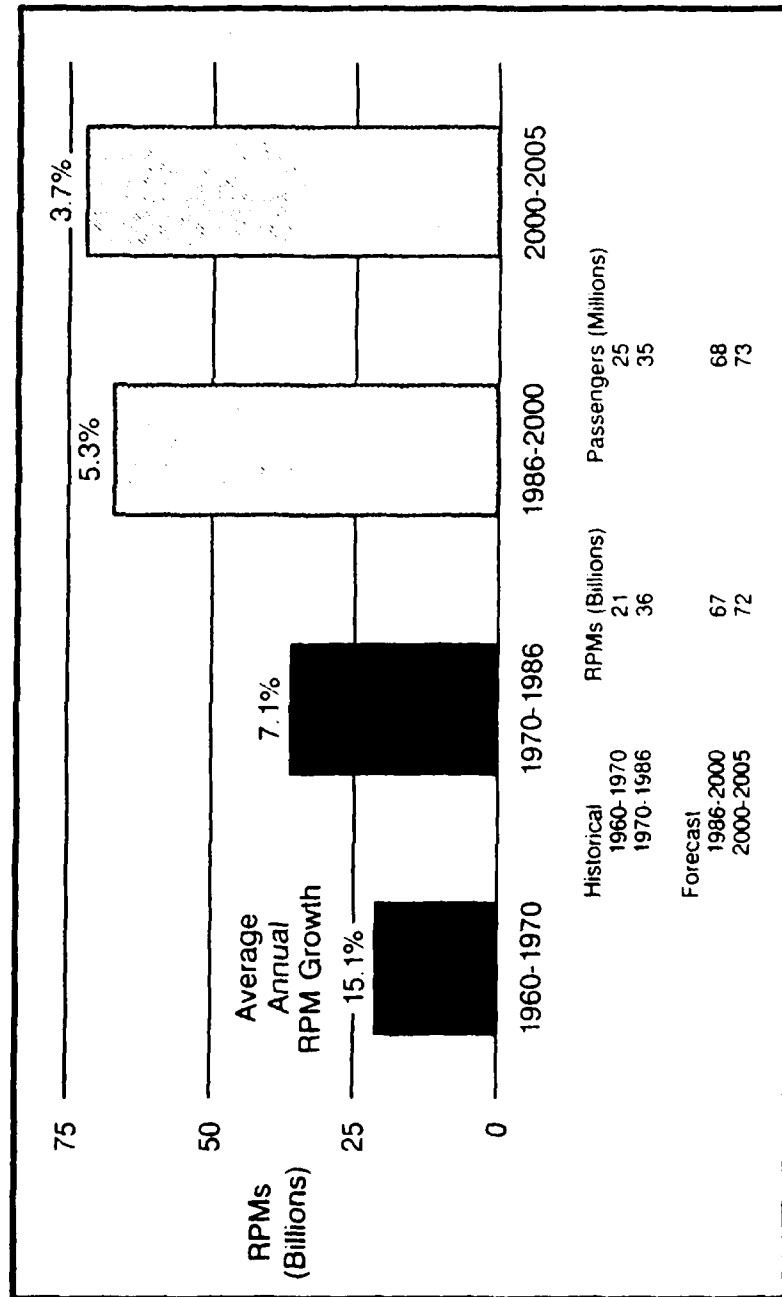
## World Air Cargo Forecast



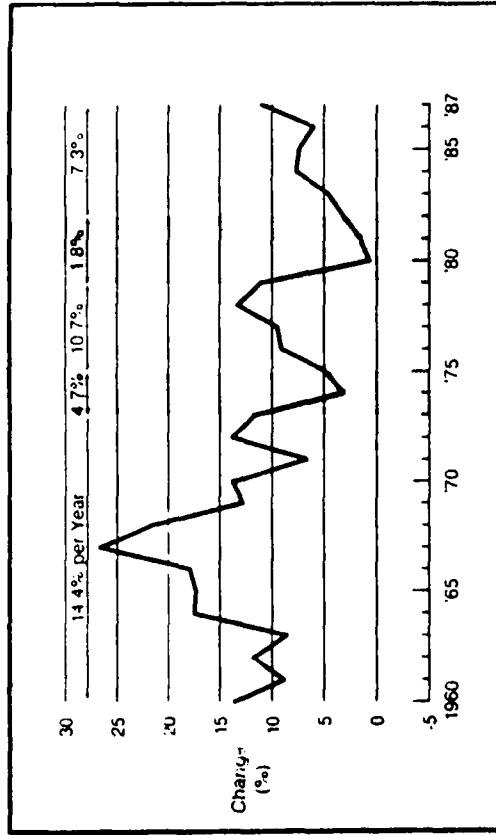
## Incremental Increases\*

Because of a much greater market volume, incremental RPM increases will be nearly double the average of the past 15 years. By the 1990s, the market will be growing each year by the size of the total market in 1960.

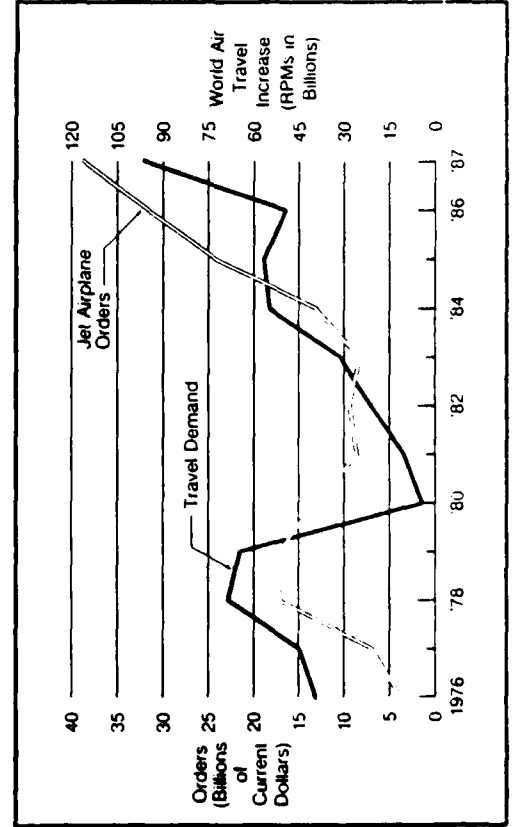
### Average Incremental Increase by Time Period



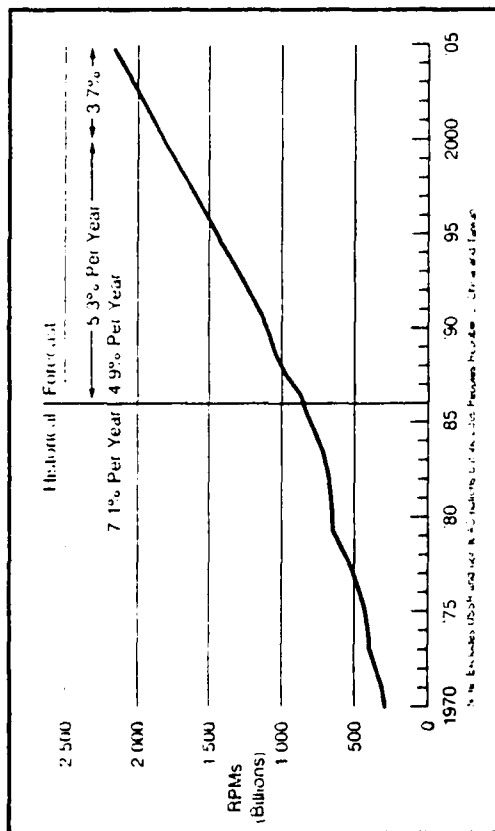
## World Air Travel Growth — RPMs (Revenue Passenger Miles)



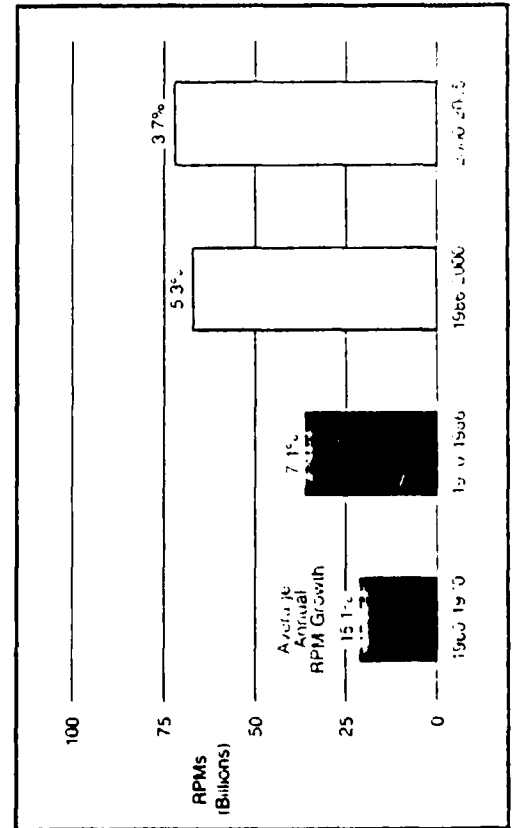
## Airplane Orders vs. Travel Demand



## World Air Travel Forecast



## World Average Annual Incremental Increases



AS OF 1 MARCH 1985

MAC HQ 312 209 WOODS & FATHOM AVE. S.E. VTEC  
NOV 8.

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